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LAKE CARRIERS' ASSOCIATION.

To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interests of Lake Carriers, and improve the character of the service rendered to the public.

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METEOROLOGICAL CHART OF THE LAKES.

The Weather Bureau, Department of Agriculture, has resumed the publication of the monthly "Meteorological Chart of the Great Lakes," to be issued during the season of navigation, and from which we take the following:

PRECIPITATION IN LAKE REGION, NOVEMBER 1, 1899 TO MARCH 31, 1900.

Less than the normal amount of rain and snow fell in the lake region during the closed season of 1899-1900. The deficiency was general throughout the watersheds of Lakes Superior, Huron, and Erie, the deficit in the latter being about 3.50 inches. The deficit in the Superior watershed was a little more than three-fourths of an inch, while that of the Huron basin was about 1.50 inch. The precipitation in the Lake Michigan basin was about normal; in the basin of Lake Ontario it was about 3 inches in excess of the normal.

The deficit in the snowfall of the present season, as compared with that of last, was 14 inches for the Lake Superior watershed, 3 inches for the Lake Michigan watershed, and 17 inches for the watershed of Lake Huron. The snowfall of March was considerably below the seasonal average, except in the Ontario basin.

As a result of the diminished precipitation, the annual high water mark on all lakes will probably be reached sooner than usual, and, unless heavy rains should fall during the spring and summer months, the general tendency on all of the lakes will be toward lower levels. There is a possibility, of course, that, with the storage afforded by the present high stage of Lake Superior, supplemented by a season of normal rainfall, lake levels may be maintained within a few inches of what they were last season. The mean stage of water on Lakes Superior, Michigan, Huron, and Erie for March, 1900, was higher than for the same month of 1899.

This fact is believed to be due partly to the large storage accumulated in Lake Superior during 1899 and partly to the heavy rains and the melting of the snow in the Michigan-Huron and Erie basins during Febuary, 1900.

OPENING OF NAVIGATION, 1900.

The steamer Jesse Spaulding, bound for Buffalo, passed through the Straits of Mackinac on April 18. The steamer M. A. Hanna reached Sault Ste. Marie on April 22, and Duluth two days later, thus opening navigation to the head of the lakes a week earlier than in 1899. Large fields of ice were encountered over the eastern end of Lake Superior, and the usual belt of pack ice was found at the entrance to Duluth harbor.

The grain fleet left Chicago for Buffalo on April 21 and arrived at the last named port April 25.

Notwithstanding the fact that the ice on Lake Erie during the season just closed was heavier than for the previous winter, general navigation opened somewhat earlier. The Detroit and Cleveland line, however, did not begin its regular schedule between Detroit and Cleveland until April 9, the latest opening of this line for many years.

The first arrival at Buffalo was on April 25, and the first departure April 21.

Navigation on Lake Ontario opened on April 2 from Oswego.

MERCHANT MARINE OF RUSSIA.*

The merchant marine of Russia on January 1, 1898, of 604 steam and 2,294 sailing vessels, was distributed as follows:

SEA.	STEAMERS.		SAILING VESSELS.		TOTAL.	
	No.	Tons.	No.	Tons.	No.	Tons.
Inland seas:						
White	33	5,027.55	396	22,149.38	429	27,176 93
Baltic	95	19,053.41	586	78,744.92	681	97,798.33
Black and Azof	263	142,512.32	773	54,535 4	1,036	197,047.72
Caspian	213	95,365.18	539	188,416.07	752	283,781.25
Total	604	261,958.46	2,294	343,845.77	2,898	605,804.23
Exterior seas	391	166,593.28	1,755	155,429 7	2,146	322,022.98
Grand total	995	428,551.74	4,049	499,275.47	5,044	927,827.21

An examination of the above table will show that in all Russian seas, with the exception of the Black and Azof, the sailing vessels predominate over steamers in number. Of the total tonnage of the merchant marine, in the respective seas, the tonnage of the sailing vessels on the White Sea is 81 5 per cent; on the Baltic, 80.5 per cent; on the Caspian, 66.4 per cent; and on the Black and Azof seas, only 27.7 per cent. The tonnage of the sailing vessels on the exterior seas forms 48.3 per cent. of the total tonnage of all the vessels, and including the Caspian Sea, 56.8 per cent. In the tonnage of the merchant marine the Caspian Sea occupies the first place, the sailing fleet exceeding in tonnage that of all the exterior seas; the steam tonnage on the Caspian Sea comes next to the Black and Azof seas, and is largely in excess of that of the White and Baltic seas.

*This report was made in answer to Department circular of June 20, 1899. Mr. Holloway says that on receipt of the circular, he asked the marine department for the necessary information, but its reply was not received until a few days ago. For other reports in the series, see Special Consular Reports, vol xviii.

ANOTHER OUTLET TO THE COAST.

The attention of Mr. John M. Nicol, promoter of the $25,000,000 Quebec and Lake Huron railway project, has been called to a new corporation called the Canada National Railway & Transportation Co., which proposes to establish a lake and rail line between upper lake ports and Montreal via Collingwood, Toronto and the St. Lawrence river. With the exception of 95 miles between Collingwood and Toronto, freight will have to be transported by water in steamers and barges. Between the two cities named an air line is to be built.

It is claimed that this route will be the shortest between points on the lakes and Montreal, with a minimum of rail and a maximum of water transportation. It will avoid the Welland canal and the long haul through the St. Clair and Detroit rivers and Lake Erie. The capital stock of the company is $5,000,000, and its headquarters are to be in Toronto.

Mr. Nicol says this company can scarcely be regarded as a rival of the Quebec & Lake Huron, for the latter will carry freight direct from Georgian Bay to Quebec, while the other company will have to tranship goods and send them in barges through the St. Lawrence. If both of these schemes are carried out, however, they will divert an immense amount of tonnage that now passes through the Detroit river.

LAKE SUPERIOR STAGE OF WATER FOR APRIL.

J. H. Darling of theUnited States Engineer Corps, Duluth, has prepared the following report on the stage of water for Lake Superior for April:

The mean level of Lake Superior in April, by the United States gauge at Marquette, was 0.38 feet above low water datum. This is0.11 feet lower than in the preceeding month but is 0.37 feet higher than April a year ago, and is 0.46 feet higher than the average April stage for the 26 years from 1872 to 1897. Lack of rain has delayed the usual rise in the lake that begins near 1st of April. United States Forecast Officer Richardson states that the rainfall in April at Duluth was only 0.39 inches as against the normal 2.42 inches for that month, showing a deficiency of 2.03 inches. The snow fall was also very light at the head of the lakes. The total precipitation—snow and rain—since January 1, this year, up to the last of April, is 3.94 inches less than the normal amount for that period. Figures for the precipitation on other portions of the lake are not at hand. The snowfall as reported weekly during the winter by the government showed more snow at Marquette than at Duluth, and this I believe has been the case every winter. This is due, I suppose, to the prevailing westerly winds of the winter season, which are dry at Duluth, but which gather moisture in passing over the westerly half of the lake, a distance of about 200 miles, before reaching Marquette.

Notwithstanding the lack of precipitation, the stage of water is good for this time of the year, as noted above; and this is attributable to the unusually high water of last season, and the large reservoir capacity of Lake Superior.

The stage of water for the coming season will of course depend on the factors of rainfall and evaporation, and these can not be predicted.

INCREASING SPEED OF OCEAN LINERS.

One of the questions that are frequently raised is the possibility of reducing the time consumed in passing between this country and Europe. The desire of many to visit the Paris Exposition cannot be gratified because the time occupied in traveling would form too large a percentage of the period at the disposal of the average business man for vacation purposes. There seems to be no reasonable hope that any change will be effected that will cut down the time required. A writer in the Quarterly Review discusses this subject of the development of ocean liners in an intelligent manner, and offers some pertinent suggestions on this particular point. He calls attention to the fact that those who are sanguine respecting the probability of largely increased speeds fail to take account of the conditions which have facilitated the past increase in the rate of traveling. The reduction of speed by one-half has occupied sixty years, which have been characterized by the most remarkable developments in the machinery of propulsion. Without such developments these great advances in speed would not have been possible. There is good reason to believe that the sources of energy at present available and the mechanical details of their transformation have been utilized to the utmost degree. Therefore, unless some further radical improvement in the machinery of propulsion occurs, no important increase of speed can be obtained. The truth lies in a nutshell: energy cannot be created—it can only be transformed. To produce a given speed, a corresponding amount of energy must be stored up and utilized in the vessel. Coal contains the latent force, while the machinery forms the agency of utilization. To gain a little more speed would involve storing much more coal, and this would mean a demand on space so disproportionate that there would not be enough room left for passengers and cargo to render a vessel a paying venture.—Modern Machinery.

CLEVELAND.

Special Correspondence to The Marine Record.

Capt. David Vance, of Milwaukee, visited this port on Thursday.

The first cargo of the large steel steamer John W. Gates was 7,600 tons.

The Cleveland Steel Canal Boat Co. started their little fleet for Buffalo, where they arrived safely on Thursday last.

The Weather Bureau will erect signal staffs at all the ports within this district, from which day and night signals will be exhibited during the season of navigation.

Operations have commenced for the release of the schooner Sophia Minch, which went ashore near Ashtabula in the fall of 1898. It is said that the hull is badly sanded up.

Mr. Robert Curr, superintendent of construction and hull surveyor for the Bessemer line, left here on the last new boat built for the company bound to Duluth. Mr. Curr expects that for the next sixty days his time will chiefly be spent between Chicago and ports at the head of Lake Superior.

Many masters and pilots engaged in the lake service will be sorry to learn that Capt. John McArthur, of the steamer Italia, was compelled to relinquish command of his boat on the trip down, owing to a severe attack of inflammatory rheumatism. Capt. McArthur will probably have to lay up for a few weeks.

It is said that the Maythams, of Buffalo, have decided to carry their opposition to the Great Lakes Towing Co., directly into this port and will send three tugs here to act with the Independent Towing Co. in opposition to the syndicate line. If this is done the trust will have an organized opposition of six to seven tugs in this port.

The Lake Traffic Association closed a three days' session here on Thursday last. No definite action as to rates was taken, but an ironclad agreement was entered into to maintain rates all through this territory, including the routes from the mines to lake ports and the cross-lake lines. When the agreement was drawn up there was not a dissenting vote to it.

It appears that vessels drawing 17 feet have been grounding on a bar at the entrance to Ashtabula harbor. No time should be lost in dredging about five feet, even if it has to be done at private expense, with a view to being reimbursed by the government at a later date. In any case, the entrance should not be allowed to silt up so as to give the port a bad name.

General Manager T. F. Newman of the Cleveland & Buffalo Transit Co., has decided to fuel the steamers City of Buffalo and City of Erie with hard coal. The city officials asked Mr. Newman to make the change. The cost of the fuel will of course be much greater, but the steamers can be kept cleaner, and Mr. Newman appears to be satisfied that it will pay in the end.

Men engaged in the marine business as well as his numerous other friends and acquaintances, were pleased this week to again meet Capt. John Mitchell, who has been spending the winter months abroad. He is the picture of rugged health and says that he has enjoyed every minute of the time since he left here the first of the year. On his trip he has been to Egypt, and the Paris Exposition.

The many friends of Mr. Robert Logan, naval architect and consulting engineer, will be pleased to learn that he is convalescent and rapidly gaining his old time rugged constitution. The most careful nursing and almost constant medical attention, coupled with a fine well developed physique finally gained the day and it is possible that after the lapse of another week or two he may again be at business with his old time vigor.

Official numbers have been assigned this week to 11,682 tons hailing from Cleveland. The General Orlando M. Poe is officially known as No. 86,501. Her tonnage is 5,657 gross and 3,892 net, built and hailing from Cleveland. The Jas. J. Hill is known on the official records at the Bureau of Navigation, Treasury Department, Washington, D. C., as No. 77,409. Her tonnage is 6,025 gross and 4,578 net, built at Lorain, O., and hailing from Cleveland.

The City of Alpena, of the D. & C. line, which runs regularly between Detroit and Mackinaw, will make the trip to Cleveland Friday night, and will lie here all day Saturday. As this is the first time she has ever been in this port, and as the possibilities are that she will not be back for some time, the officers of the company have decided to permit an inspection of her by the public, which will be held all day Saturday up to the time of her departure. She has been practically rebuilt during the winter just closed, something like $50,000 having been spent on her.

BUFFALO.

Special Correspondence to The Marine Record.

Nearly 78,000 tons of coal was shipped last week, Chicago taking 32,000 tons.

Lake survey charts will be on sale hereafter at the office of Major Symons, D. S. Morgan building.

The Donnelly Contracting Co. will build a large scow for use in the construction of the north breakwater.

Charles Schmidt, formerly chief clerk C. & B. line at this port, has been promoted to the position of local freight agent.

Among the first arrivals here may be named the fleet owned by the Cleveland Steel Canal Boat Co. They reached port on Thursday last.

Yachting will be on the boom here this summer, in fact it's on the boom now, judging from all the talk I hear about jibbooms, main booms, etc.

Philadelphia Board of Trade has petitioned Congress against the bill for the acquirement and enlargement of the Erie canal by the United States.

James Shanahan, who is a naval veteran of the Civil War, has been appointed deputy inspector of customs and assigned to duty as night clearance clerk.

Inspector N. B. Conger of the Weather Bureau, visited here this week on business for the department. He expects to be in Detroit towards the end of the week.

Freight rates have ruled as follows: Chicago, 75 cents; Duluth, 50 cents; Milwaukee, 70 cents; Toledo, 40 cents; Manitowoc, 70 cents; Waukegan, 80 cents; Green Bay, 70 cents, soft coal on contract.

It will be a matter of deep regret should there be any more labor disputes on the docks here during the season, although it must be said that all interests don't seem to be quite working in harmony just at present.

Officials of the American Ship Building Co. have looked over the plant of the Buffalo Dry Dock Co., and have decided to construct two 600-foot docks in the newly acquired property. These dock will accommodate the largest vessels on the lakes.

Vice-President Farrington, of the Northern Steamship Co., says there is nothing in the report that his company will operate a line of passenger boats between Chicago and Buffalo. Mr. Farrington knows of no arrangements for the construction of two steamers similar to the North West and the North Land for the proposed route.

The International 'Longshoremen's Association has issued a phamplet under the title, "The Finish of the Stevedore-Saloon-Bossism of the Port of Buffalo." It details the report of the special committee to the Lake Carriers' Association while in convention at Detroit in January last, and also before the committee on grain handling in Cleveland.

Edward Smith, president of the Buffalo Dry Dock Co., lately absorbed by the American Ship Building Co., will manage the Buffalo plant for another year. Capt. John Anderson and A. C. Adams, who were in personal charge of the works before the sale, and John Humble, the shipbuilder, have been permanently employed by the trust in their old capacities.

Freight loaded by any of the contractor's men here will not be unloaded at the upper lake ports, where there is a union, until the fine imposed on the vessel is paid. It is not believed that the vessel owners will consent to pay such fines very long, as the amount usually imposed in such cases is from $100 to $500. As the principal movement of package freight is from Buffalo westward, it is believed by the freight handlers that Mr. Barter's action in telegraphing all other ports is the best thing that could be done to bring the vessel-men to time. Mr. Barter is secretary of the International Longshoremen's Association and his instructions cover 23 ports.

Dr. J. B. Stoner, who has been in charge of the marine hospital service at this port for a little over two years, received orders from Surgeon General Wyman of the United States Marine Hospital Service to proceed to St. John, N. B., as medical inspector of immigrants, for duty in the office of the United States Commissioner of Immigration for Canada, the order to take effect upon being relieved by Surgeon Eugene Wasden. Dr. Wasden took charge of the service at this port accordingly. He has recently been on special duty at the Pasteur Institute at Paris, was ordered back to Washington, and as he had several years' service in the South he was given the Buffalo appointment when Dr. Stoner was required at the port of St. John.

J. B. Donnelly, president of the Donnelly Contracting Co., this city, recently returned from Cleveland, bringing in his pocket contracts for over $1,000,000 of Government work in the harbors of Ashtabula and Lorain. The contracts on which the Donnelly Co., was the lowest bidder are for the extension of the Government breakwaters in the two harbors mentioned. The bid of the Donnelly Contracting Co., for the work at Ashtabula was $410,692, and for the Lorain work, $635,519. The company has four years in which to complete the work. The Donnelly Contracting Co., now has on hand more than $1,600,000 of United States Government and State work, including harbor work at Fairport, Conneaut, Erie, Buffalo and Cape Vincent. The company bids only on State and Government work, and has recently spent nearly $100,000 in making additions to its plant, which is now one of the best on the lakes.

DULUTH—SUPERIOR.

Special Correspondence to The Marine Record.

A new company known as the Maytham Towing & Wrecking Co., has entered the field at the head of the lakes as a rival of the Great Lakes Towing & Wrecking Co.

The new steamer now being built for the Canada-Atlantic Transit Co., has been named the Ottawa. She is nearing completion in the yards at Toronto, and it is expected that she will be ready for service the latter part of this month.

Lumber rates seem to be fixed at $3 per M. feet. This rate is the highest opening rate that has been paid from the head of the lakes for many years. Last year the opening was considered strong at $2. The highest rate paid was $5.25, and for most of the season it was around $4.

It is reported that the Northwestern Coal Co. is going to build the other half of the large dock it has planned in Allouez Bay. The present dock only represents one-half of the proposed dock although at present one of the largest docks in the United States. It is said, however, that the company is not going to build for its own use, but for one of the railroads —probably the Milwaukee road.

Davis & Comstock, lumber shippers, take pride in the fact that they loaded the first boats for Chicago and the first for Cleveland, to visit the head of the lakes this year. The John Spry and Johnson loaded lumber for Chicago at the Scofield mill, at West Superior, and the Mills and tow loaded lumber at McCord's for Cleveland. This gives Davis & Comstock the first boats for Lake Michigan and the first for Lake Erie.

Whaleback 115, which went ashore on Pie Island last fall, is to be examined and if not too badly damaged is to be hauled off and put in drydock. She was being towed through a heavy snow storm along the north shore of Lake Superior, when the tow line parted and she drove ashore. The crew had a hard experience before reaching a station on the Canadian Pacific road. Tonnage is tonnage these days and it is cheaper to patch up an old hull than to build a new one it can also be usually done in much less time, especially the way the steel market is just now.

Lumber shippers cling to the idea that a $2.50 rate is about right, although tonnage would be taken at $2.75. Vessels are holding for $3 with little chartering so far. A broker very pertinently states the vessel's side of it in this way: "The $3 rate at the opening this year is little better than the $2 rate at the opening last year, and for these reasons: The expense of handling the product is a great deal more than last season; the price of fuel is $1.10 a ton higher than last spring; labor on board is 20 per cent higher, dock labor will be 20 per cent higher, oil and other supplies are from 20 to 33 per cent higher than last spring."

General Manager Harris, of the Lake Superior & Ishpeming railroad, estimates shipments of fully 3,000,000 tons of ore from the port of Marquette this year, his figures being based on a careful estimate of the probable output of every mine on the Marquette range this season. Similar estimates covering all five ranges of Lake Superior iron district in the states of Michigan, Minnesota and Wisconsin, show probable shipments of 20,000,000 tons this year, or more than double the largest previous annual production of any year previous to 1895. In my judgment, this year's iron ore output of Lake Superior mines will unquestionably yield, and very likely exceed, 20,000,000 tons.

SAGINAW.

Special Correspondence to the Marine Record.

Col. Lydecker was in the city last week, and approved the city engineer's plan for a jack-knife bridge at Genesee Ave.

Capt. Chas. Maeles, owner of the tug Gladiator has chartered his tug to Toledo parties for log towing for the season.

The steam barge Ed. Shores, Capt. Mike Madden, and tow, left the river Thursday for their first trip to Lake Superior.

Capt. William Gordon has been awarded the contract for taking care of the buoys in the Saginaw river for the year ending June 30, 1901.

The steam barges A. A. Turner and Maine and their consorts are chartered for six trips to Duluth. Lumber to come here for the Thershon Box Factory.

Eddy Bros., of Bay City, this week concluded the purchase of the steam barge Langell Boys and barge Comstock. They will be used to carry their own lumber.

Horace Smith, U. S. Inspector in charge of dredging on Saginaw river, has arrived and got things moving, two dredges will be employed during the season and a general cleaning up will be the program. Capt. Mike Maher, ex-boiler inspector will be Mr. Smith's assistant.

Some of our barge owners here at Bay City who, during the winter blowed themselves in great shape on "repairs," with the expectation of getting rich this season, are a sight to behold. Faces as long as the moral law as it were, and bill to be paid (after first trip) that would give you the nightmare.

Capt. John Ballor, master of the tug Andrew McLean, who has been missing since Tuesday last, was fished out of the river Sunday morning. It is said the captain was around Tuesday night on business until 2 o'clock a. m., and it is supposed that he fell from the high dock and struck his head on the rail, stunning him and causing his drowning. He leaves a wife and four children at West Bay City.

DETROIT.

Special Correspondence to The Marine Record.

The cost of the projected breakwater at Mackinac harbor will be $80,000.

The old warship Yantic is being overhauled and calked for service as a naval reserve practice boat.

The Toledo Foundry & Machine Co. libeled the steamer A. L Hopkins on a claim of $732.98 due on a contract.

Capt. James Davidson, of West Bay City, has sold 14 of the 32 vessels he owned a year ago. He now has on the stocks a canal sized steamer and a barge of large capacity.

The second life-boat, made by the Empire Life-Boat Co., was launched at Manistee this week, to be sent to the Paris Exposition. It is 35 feet long, 6½ feet beam, and will hold 50 people.

The request for three residences at Grosse Isle for the accommodation of light-house keepers, at a cost of $8,500, has been cut by the committee of Congress to one house at a cost of $3,500.

A lumber shipper says that the Canadian lumber manufacturers will ship a great deal of lumber into the United States this season, as the prices are sufficiently high to enable them to pay the duty.

The sloop yacht Sultana will be offered for sale again on May 15, at 10 a. m. The reason she was not sold when she was put up recently was, it is said, because the sheriff brought in a bill against her for $1,300.

The Jenks Ship Building Co., Port Huron, settled the labor difficulty with their workmen and labor is going on as usual, perhaps a little more brisk, as some of the slower or less skilled of the workmen were not re-employed.

The old Grummond Line steamer Atlantic, sold at United States marshal's sale recently for $800, was bought by Homer Warren of Detroit. She has been taken to the Detroit dry-dock to be put in condition for the general freight business.

Owing to excessive rates for unloading and loading, and the low rates for carrying, Mayor Gilchrist, of Alpena, has laid up his lumber barges Knight Templar and Light Guard, or, at least, such is the explanation offered at this time.

Senator McMillan has asked Congress to amend the agricultural appropriation bill by allowing $15,000 for a telephone line between Glen Haven and South Manitou Island, in order that a signal station can be established on the island by the Weather Bureau.

Capt. William Thorne, for years one of the best known lake masters, whose last command was the Northern Star, of the Northern Steamship Co., has been appointed crier of the United States courts at Detroit, to succeed the late Capt. Harry G. Blanchard.

The Detroit & Cleveland Navigation Co. has bought enough stock from the Cleveland & Buffalo line to give them a 50 per cent. interest in the steamers State of Ohio, State of New York and City of the Straits, plying between Cleveland, Toledo and Put-in-Bay.

The Pere Marquette freight handlers' strike continues in force with but little hope of immediate settlement. Both sides positively refuse to arbitrate. There is plenty of work to be had and most of the strikers are now temporarily employed and earning a living while the strike is in progress.

The bid of General Passenger Agent A. A. Schantz, of the D. & C., has been accepted by the War Department for carrying the troops at Fort Wayne to Portland. The route is from Fort Wayne to St. Ignace by boat, and thence by the Duluth, South Shore & Atlantic and Northern Pacific to the Pacific coast.

The Detroit Ship Building Co. has contracted with the Erie Railroad Co. for the engines and boilers for a new steamer. The order calls for three Scotch type boilers, 210 pounds pressure, and triple expansion engines. The new steamer will be a sister ship of the Wilkesbarre, for which the Detroit Ship Building Co. is now building the engines and boilers.

Members of the life-saving crews at the two following stations are: Thunder Bay Island—Captain J. D. Person, Chas. Raymond, Chas. Furtaw, Jacob Hauck, Eli Knudson, Fred Porier, Frank Hyde, Arthur Cleary, Walter H. Oles. Middle Island—Captain Eugene P. Motley, C. D. Coburn, Eber Warwick, John Robinson, Dan McLeod, Joseph Hubbard, W. L. Whitman, George J. Hassett, John M. Smith, of Port Hope.

In addition to its shipbuilding business, the Detroit Ship Building Co. operates a large factory in which it manufactures a line of supplies for marine work, and among these specialties are the Kirby lubricators. A catalogue is devoted to this special subject and gives excellent engravings of the various types of lubricators, with a complete detailed description of each. They include various types of lubricators for engines and pumps, also hand oil pumps.

A new car ferry line from Kewaunee to Ludington is one of the possibilities which is said to be under consideration by the officials of the Pere Marquette railway. The new line, it is said, will connect with the Kewaunee, Green Bay & Western at Kewaunee, and will give that road a long haul across the state and a lake outlet, while under the present conditions the road is forced to send its trans-lake business to other ports, greatly lessening the profits on its business.

Col. Lydecker, Corps of Engineers, U. S. A., says he thinks the work of widening the upper portion of Hay Lake channel will be commenced at an early day. The question of providing a better channel at the Neebish—whether to widen the existing channel there or make a new one through the west Neebish—is yet to be decided by Congress. Plans and estimates for the latter improvement, he says, have been practically completed, but may be modified before presentation to the Secretary of War for approval.

James C. Wallace, of Cleveland, general manager of the American Ship Building Co., says that within six weeks the West Bay City yard of the company will lay the keel of another big steel steamship. He declines to say for whom the boat will be built. In connection with the report that the West Bay City plant would be dismantled, Mr. Wallace says: "All talk of the American Ship Building Co. moving the West Bay City machinery to Buffalo is bosh. The reports along this line were circulated when we secured the dry-dock property at Buffalo. The West Bay City shipyard is good property right where it is, and we are going to continue building boats there."

The Arnold Transit Co. is the name of a line recently formed to succeed to the ownership of what has heretofore been known as the Arnold line of steamers, plying St. Mary's river between the "Soo" and Cheboygan. The capital stock of the new company is $135,000. Its officers are: President and general manager, Geo. T. Arnold, Mackinac Island; vice president, Geo. Kemp, Sault Ste. Marie; secretary, H. R. Whittemore, Mackinac Island; treasurer, M. J. Weaver, Sault Ste. Marie. The Soo-Cheboygan service of the Arnold Transit Co. for 1900 began Thursday last, when the steamer Ossifrage started. Pending the completion of the new steamer now being built for the Arnold Transit Co. by the Craig Ship Building Co., at Toledo, O., the Ossifrage will be the only boat in the service on this route. The new steamer, it is expected, will be completed by the last of June and will be immediately put into service. Capt. J. B. Mondor, who is in Toledo, O., superintending construction and completion of the handsome and speedy steel passenger steamer, will be in command. The new steamer is 209 feet over all, 34 feet beam, and 21½ feet deep. She will carry triple expansion engines, 20x34x55, by 30-inch stroke, to have a speed of 18 miles an hour. Her boilers are four of the Roberts water tube type. She has been designed with a view to comfort and is to be finished elegantly, with accommodations for several hundred passengers. She will likely be christened the Chippewa.

CHICAGO.

Special Correspondence to the Marine Record.

Grain freights are unsteady on the basis of 2 cents on corn to Buffalo.

The small schooner Una is in the Great Lakes Towing Co.'s floating dry dock for some new frames, bottom planking and calking.

The Edward J. Hines Lumber Co., may be considered the heaviest dealers in the country. Their purchases of stuff this season is greater than any other firm in the trade.

John R. Boyington, aged 65 years, died at the Chicago Marine Hospital, Monday, May 7th. The deceased had been a cook on the lakes for about 40 years and was well known.

The steamer F. H. Prince, which had been laying at the Hedstrom Coal Co.'s dock since Friday waiting to unload, went to South Chicago Monday to discharge her cargo in consequence of the coal handlers strike at this port.

The Green Dredging Co. sent their No. 7 dredge in tow of tugs Andrew H. Green and Chicago to St. Joseph, Mich., Saturday, to remove the bar opposite the Three I's railroad depot, which had been an obstruction to navigation.

A. G. Dexter, of St. Joseph, Mich., for several years chief bookkeeper at E. A. Graham's dock, has been appointed inspector of dredging for the lakes. Inspector Dexter commenced his official duties Monday morning at St. Joseph.

William Saville, shipbuilder, has given the tug Tom Brown some new frames and deck beams, part new deck, new shelf, clamp and sole pieces, considerable new ceiling on both sides, new hatch coamings and new pilot, engine and boiler houses.

Capt. Frank McGregor has given the passenger steamer Lena Knoblock considerable general repairs and her boiler has received new firebox and flues. She will be ready next Sunday for the excursion business at the Lake Front and Lincoln Park.

Six of the Rutland Line steamers made their first appearance here this season, last week. The J. R. Langdon, W. A. Haskell, A. McVittie and F. H. Prince with coal, the Governor Smith with coal and merchandise and the H. R. James with merchandise. The James and Gov. Smith discharged at the Rutland Line's new warehouse in the north branch.

The Great Lakes Towing Co. now have their tugs Perfection and Prodigy for outside work on Lake Michigan. The Chicago Towing Co. have the tug George D. Nau, recently sent here by Chas. Maytham, of Buffalo, to do their outside work. Great rivalry exists between Capt. Smith of the tug Perfection and Capt. Glover of the tug Nau, and some racing down the lake for tows was done last week. Both captains claim to be victors. Capt. Smith brought in the first tow of one schooner, and Capt. Glover brought in two schooners several hours afterwards.

"Yes, it is true that the American Ship Building Co. has contracted to build boats for a new Montreal line," said W. L. Brown, president of that company, "but the details are yet to be determined. The boats will carry about 75,000 bushels of wheat and will be of steel construction. Specifications are now being drawn. There is a great field in the Montreal trade and vesselowners seem disposed to enter it."

The drainage canal gates were opened again this week without advance warning to marine interests. Half a gale of wind from the northeast was blowing at the time, thus backing the water into the harbor. In the narrow draws of the bridges at Eighteenth, Canal, Main and South Halsted streets the velocity of the current was five miles an hour, in consequence a mix up occurred at Lake street bridge. The Wilbur suffered damage. Her stem was broken and a cathead carried away. The steamer W. M. Eagan sustained damage at Erie street bridge, and there were numerous slight accidents at various points.

The Graham & Morton Transportation Co. launched their steamer Mary, Saturday afternoon, in the presence of a vast concourse of people, who warmly welcomed the new edition to the company's fine fleet of steamers. The Mary is a very handsome stern wheel steamer and has very fine lines which were designed by Messrs. Morley & Hill, of Marine City., Mich. Her dimensions are 137 feet over all, 25 feet beam, 10 feet molded depth. She has a Herreshoff engine and Sheriffs wheel. She is provided with bilge keels to steady her in a seaway. No expense will be spared by the company in her fit-out and furnishings. Her speed is estimated at 20 miles per hour. She will go into service next month and will make two trips daily between St. Joseph and Chicago. Capt. Boswell, formerly of the City of Louisville will command her.

PAPER ROPES.

According to a contemporary, paper rope is manufactured by the Ironmongers' Rope Works, Ltd., at Wolverhampton, England, and is highly recommended for power transmission. As the same company manufacture cotton rope, with which the paper rope competes, this recommendation carries considerable weight with it. Paper rope is of a light fawn color, fairly smooth to the touch, slightly lighter than cotton rope, and is very pliable even to one and one-half inch diameter. These ropes are manufactured similar to other ropes, and are made up of three strands each, each strand being made up of a number of smaller strands. The rope is treated with boiled oil, making it practically waterproof. Its tensile strength is not as great as that of cotton rope, but it is said not to wear internally as do these other ropes. The rope can be spliced like any other rope, though the makers are introducing a metal coupling to do away with splicing, and this is said to both make a better connection for power transmission work and also to effect a great saving in time as compared with splicing.

Experiments recently conducted to find out the driving power of ropes made of different material were carried on. A single-grooved pulley of, approximately, twenty-four inches in diameter, fixed on a horizontal shaft revolving at a rate of fifty-four revolutions per minute was used, and ropes of different material were placed in the pulley groove. One end was attached to a spring balance fastened to the floor, and on the other end weights of varying sizes were hung. The results obtained were as follows:

	Pull with 7 pounds, lbs.	Pull with 14 pounds, lbs.	Pull with 28 pounds, lbs.
1-inch manilla	34	84	126
1-inch white cotton, unprepared,	49	84	154
1-inch white cotton, prepared	45	80	135
1-inch paper	63	105	189

In all cases the pull had a tendency to decrease when the experiment had been proceeding for a minute or so. With the paper rope this was less marked than with others, and a point was soon reached when the pull remained, as nearly as could be told, constant. There was a slight vibration of the spring gauge pointer, which made readings to a pound difficult.

The ropes were examined after the test. The cotton and hemp showed signs of fraying; the paper was simply polished. If similar results can be obtained in practical work, there seems to be a field for this new rope.

NOTICE TO MARINERS.

MANISTEE PIERHEAD LIGHT STATION.—Notice is hereby given that, on or about June 1, 1900, the following changes will be made at this station, near the end of the north pier, at the entrance to Manistee river, easterly side of Lake Michigan.

The fixed red lantern light now shown from the outer end of the elevated conduit on the pier will be discontinued and the conduit removed.

A fixed red light of the sixth order will be established in a black octagonal lantern on the gable end of the fog-signal building, which will be moved to and located near the extreme outer end of the north pier, and the elevated walk will be extended to the fog-signal building.

The focal plane of the light will be about 30 feet above mean lake level.

The old pierhead tower (light discontinued) on the south pier will be removed.

By order of the Light-House Board.

FRANCIS J. HIGGINSON,
Rear-Admiral, U. S. Navy, Chairman.

IMPOSSIBILITIES OF SUBMERGIBLE BOATS.

Engineering discusses the problem of submarine boats, and points out that they have no buoyancy, and their low longitudinal stability or tendency to pitching is a matter of serious moment. A man need only step forward to send the nose of the boat down. For this reason the Plongeur of Bourgeois failed and the length of boats has been reduced again. Goubst has gone furthest in this direction, and his two men always sit in the middle of the boat. Bauer tried to apply counterpoises and Holland automatic pumps to restore longitudinal equilibrium. Nordenfelt did not deprive his boat of all buoyancy and counteracted its effect by a submerging propeller. The flooded boats are better off in this respect. But even in their case we notice a reduction in length; the Zede had a length of 45 metres, the Morse of 36 metres, the Narval of 34 metres. It has, on the other hand, been pointed out that they are not good sea-going boats, hardly fit for rough weather; and their own designers have proposed to give them a little freeboard. If we do that, we lose the chief advantage of the submarine boat, the immunity against projectiles; and we may argue whether we had not better return to ordinary boats, in which we are not tied down to small space and small speed, and all sorts of undesirable conditions. Submarine boats remain dangerous to manage. On an average, perhaps, we construct them strong enough to descend to a depth of 100 feet. Supposing a boat moving at the usual speed under water, 8 knots, is to discharge a torpedo. Two men are sent forward; the boat at once inclines 15 degrees, and within half a minute it will have arrived in its critical depth. If there is any delay or any fault in the steering gear or in the application of safety weights, etc., every second will seriously increase the pressure of water outside. Trials made with the Gymnote, moreover, indicate that submarine boats do not obey their horizontal helms with sufficient rapidity. The Gymnote always overshot her mark, and would not keep on a straight course, but described a succession of curves. Professor Busley, a German expert, tried to pull a submarine boat under water; it could not be done when the speed exceeded four knots. That all operations near the coast or in shallow water are exceedingly dangerous, need not be emphasized. Campbell's boat managed to wriggle herself out of the Thames mud again in 1886; the accident testified to the nerve and skill of Lord Charles Beresford, but also to his good luck. These dangers are increased by the exceedingly limited range of sight under water. On a clear day, a diver, 20 feet below the surface, is hardly able to see further than 25 feet. The low speed and the short period during which such a boat can be kept in motion without replenishing its charge limits the range of action of the submarine boats badly. The Narval is stated to have cost about £30,000. For little more, it is added, we could construct a torpedo-boat destroyer of fourfold speed and three-fold displacement which would achieve something.

EASTERN FREIGHTS.

Messrs. Funch, Edye & Co., New York, report the Eastern freight market as follows:

In consequence of the concessions generally made by owners of tonnage committed for this coast, a much increased list of fixtures for grain has been established, mainly of larger vessels for ordinary picked ports, the rate for which for full cargo of heavy grain closes at 3s., the opinion of general cargo entailing an advance of from 1½d. to 3d. The enquiry for Cork f. o. boats has not been so active, and 3s. 6d. from the range of loading ports apparently the highest figures shippers would be willing to pay. This week has been an unusually lively one for time charters, which, in the rates secured, reflect the large demand made by the South African war for first-class tonnage, especially such applicable to the Cape, Australia and the China-Japan berth. Timber freights from the Gulf are inactive, as owners are disinclined to grant concessions demanded by shippers; chartering for general cargo from the Gulf ports appears practically ended for the season. The demand for boats for general purposes has been fairly active, and been the means of preventing a threatened further decline in grain freights.

Several charters for case oil vessels have been closed during the week, and the most pressing demands having thus been filled, the enquiry has somewhat abated and extreme rates are not obtainable just now. It is doubtful, however, whether the wants of the trade are really fully covered; possibly the lost ground may be recovered before long. In other directions we have nothing new to report, as the scarcity of tonnage has not diminished; the demand, however, is not very pressing.

STATISTICAL REPORT OF LAKE COMMERCE THROUGH CANALS AT SAULT STE. MARIE, MICHIGAN AND ONTARIO, FOR THE MONTH OF APRIL, 1900.

EAST BOUND.

Articles.	U. S. Canal.	Canadian Canal.	Total.
Copper.....net tons	674	.....	674
Grain.....bushels	529,000	.....	529,000
Building stone.....net tons	.....	.....	.....
Flour.....barrels	97,000	.....	97,000
Iron ore.....net tons	197,619	6,944	204,563
Iron, pig.....net tons	.....	.....	.....
Lumber.....M. ft. B. M.	.....	.....	.....
Silver ore.....net tons	.....	.....	.....
Wheat.....bushels	2,336,627	205,000	2,541,627
General mdse.....net tons	1,386	7	1,393
Passengers.....number	.....	129	129

WEST BOUND.

Coal, hard.....net tons	43,242	.....	43,242
Coal, soft.....net tons	100,979	10,520	111,499
Flour.....barrels	50	.....	50
Grain.....bushels	.....	.....	.....
Manufactured iron...net tons	1,410	.....	1,410
Salt.....barrels	25,277	.....	25,277
General mdse.....net tons	7,726	133	7,859
Passengers.....number	67	50	117
Freight—			
East bound.....net tons	292,577	13,101	305,678
West bound.....net tons	157,151	10,653	167,804
Total freight.....net tons	449,728	23,754	473,482
Vessel passages—			
Number.....	379	48	427
Reg'd tonnage.....net tons	512,786	26,405	539,191

SHIPYARDS AT PORT ARTHUR.

A special from Port Arthur, Tex., this week, states that W. I. Babcock, of Chicago, president of the Chicago Ship Building Company, at the instance of John W. Gates, has visited the port with a view to the building of shipyards. He looked over the ground and selected a site for the shipyard and machine shop. The plans for the dry dock include four berths for new vessels, all of them to be of large capacity, with berths for repairing vessels of different capacities. The site selected comprises between 75 and 80 acres. When completed the plant will employ 1,500 men.

ABOUT THE OCTAVIA.

SARNIA, ONT., May 7, 1900.

To the Editor of The Marine Record:

In a recent issue of the RECORD I notice that Mr. J. H. Morrison, 358 Hancock street, Brooklyn, N. Y., would like to learn some particulars regarding the lake-built craft Octavia.

The Octavia was built by Peck & Kirby—Capts. E. M. Peck and S. R. Kirby. In 1864 Mr. R. H. Harmon sold her to an English firm. I was then master of the schooner Saranac, and Capt. Peck offered me charge as soon as the Octavia was launched and wanted me to fit her out and take her schooner rigged around to New York to receive her machinery. Mr. Kennard also asked me to take charge of her, however, my owner, Mr. Harmon, refused to let me go, but sent me to Bruce Mines to load copper ore in the Saranac for Liverpool, England.

I had to lighter some of the ore to get through the old Welland canal, and while reloading it at Montreal the Octavia came down in charge of Capt. Goulder, father of the now prominent admiralty lawyer, Harvey D. Goulder, Esq., Cleveland.

Capt. Goulder and I talked over matters in Montreal, and I remember he had a great deal of trouble with the Octavia. She did not steer well, leaked badly through her stern pipe and several other matters which we remedied the best we could, and she arrived at New York all well.

In giving her machinery, they did not give her boiler enough, besides the propeller wheel was found far and away too small and she was found to be very slow, so that Mr. Kennard sold her. She was a beautiful model though, and if Capt. Kirby had only fitted out her machinery, and drafted engines and boiler and fitted her wheel, she would have led anything out of New York at the time. The Octavia crossed the Atlantic later, but I then lost track of her.

Capt. Thos. Wilson (and a better man we never had) died very sudden, and I am very, very sorry.

Yours truly,

CHARLES GALE.

THE "SOO" POWER CANAL.

Though the "Soo" Water Power Canal Co. takes umbrage at what it considers the unnecessary excitement of the Lake Carriers' Association in demanding that the company obtain the consent of the Canadian government to the diversion of the waters for the construction of its canal, says the Detroit Free Press, yet it is the opinion of competent men, such as army engineers and pilots who have traversed that river for more than a decade, that the association is morally in the right, whatever may be the legal correctness of its position.

There is a good deal of mystery about the movements of the company. While the names of its president and general manager are known, nobody around here seems to know who its stockholders are; there is merely the vague assertion that they came from Philadelphia. Nobody knows to a certainty whether it has ever consulted the Canadian government concerning the building of remedial works which will equalize the diversion of the waters from their regular channel and makes the total outflow of the same volume as it is at present. The company, riding its high horse, tells the association that if there is any disagreement between itself and the Canadian government it is no cause for worry for the lake carriers. This may be so, but the house committee is wise enough to refuse to act on the question pending the settlement of the controversy, and in the meantime the session is rapidly drawing to a close.

On the American side of the river the riparian rights which govern the use for power purposes of all that part of the waters not pre-empted by the United States government are held by the Chandler-Dunbar Water Power Co., which furnishes power for the electric lighting, electric car service and the various factories of the town. The new company dare not encroach on the rights of the Chandler-Dunbar concern, and the only way it can avoid doing so is by building dams on the Canadian side for regulation purposes. It will be interesting to know the exact status of negotiations between the new company and the Canadians. The new concern has spent very little money on the project so far, though it has in fact taken what appears to be the preliminary steps in the construction of the canal.

A NEW SELF-RECORDING ANEMOSCOPE.

A very valuable meteorological instrument has recently been invented and perfected by Mr. Jos. Baxendell, F. R. Met. Soc., principal of the Observatory at Southport, England, and as it has been in use and has demonstrated its worth, some notice has been taken of it in scientific circles. This instrument is a self-recording Anemoscope. It has an exceedingly light, but large double-bladed spread-vane, mounted on a long tubular steel spindle, the whole weight of which is carried on ball bearings at a short distance below the vane. Near the lower extremity of the spindle is a drum rotating with it, round which is wrapped a "chart." This is suitably secured, and is acted upon by a recording pencil. The instrument, while acting in the lightest airs, is steady in the strongest gales. At a discussion on a descriptive paper given by Mr. Baxendell before the Southport Meteorological Society, unanimity of opinion prevailed concerning the merits of the machine, which, it was pointed out, showed the minutest oscillations of the wind without destroying the value of the records.

COMPARATIVE.

Attention has been called to the relative power equipments and capacities of the largest ocean liner and the most powerful locomotive now in operation. The new Rogers consolidation engine, built for use on heavy grades on the Illinois Central is compared with the Oceanic, the steamship that exceeds the Great Eastern in size and in power. The locomotive is designed to haul trains of a maximum weight of 2,000 tons over grades of thirty-eight feet to the mile. The Oceanic is 704 feet in length and on a draft of thirty-two and one-half feet displaces 28,500 tons. Its engines indicate about 28,000 horse-power when driving the vessel at a speed of twenty-two land miles an hour. The big locomotive could haul about 3,250 tons weight at a speed of twenty-two miles an hour on the level, and while so doing would indicate about 1,760 horse-power. With this basis of comparison the Scientific American estimates that it would require sixteen such locomotives to drive the Oceanic through the water at a speed of twenty-two miles an hour, or eight locomotives would carry it on a level ship railway. Loaded in box cars of the ordinary 40,000 pounds capacity, the Oceanic and its cargo would fill 866 freight cars, which would be a train about six miles in length.

LAKE COMMERCE AT DULUTH AND SUPERIOR FOR NAVIGATION SEASON OF 1899, WITH COMPARISONS OF COMMERCE OF PREVIOUS YEARS.

CONDENSED STATEMENT OF VESSELS RECORDED AT DULUTH-SUPERIOR HARBOR DURING NAVIGATION SEASONS OF 1895 TO 1899, BOTH INCLUSIVE.

Year.	Steam vessels entered.	Sail and other vessels entered.	Total vessels entered.	Registered tonnage entered.	Steam vessels departed.	Sail and other vessels departed.	Total vessels departed.	Registered tonnage departed.	Total vessels entered and departed.	Total Registered tonnage.
1895.....	4,630	875	5,505	5,665,752	4,571	910	5,481	5,768,520	10,986	11,434,272
1896.....	4,603	924	5,527	6,626,101	4,484	937	5,421	6,726,967	10,948	13,353,068
1897.....	3,957	907	4,864	6,342,118	3,956	938	4,894	6,503,747	9,758	12,845,865
1898.....	4,547	972	5,519	7,014,924	4,354	997	5,351	7,120,313	10,870	14,135,237
1899.....	4,726	1,090	5,816	7,235,288	4,588	1,122	5,710	7,198,213	11,526	14,433,501
Totals....	22,463	4,768	27,231	32,884,183	21,953	4,904	26,857	33,317,760	54,088	66,201,943

RECEIPTS, SHIPMENTS AND VALUATIONS—DULUTH AND SUPERIOR COMBINED.

Year	Receipts, net tons.	Valuation of receipts.	Shipments, net tons.	Valuation of shipments.	Total receipts and shipments.	Total valuation, receipts and shipments.	Increase in valuation over previous year.
1895.....	2,035,465	$27,443,512	4,289,886	$67,556,488	6,325,351	$ 95,000,000	.....
1896.....	2,407,880	27,717,561	5,478,953	83,959,339	7,886,833	111,676,900	$16,676,900
1897.....	2,492,420	28,963,122	5,982,804	89,588,063	8,475,224	118,551,185	6,874,285
1898.....	2,979,809	34,578,955	7,147,452	108,064,065	10,127,261	142,643,020	24,091,835
1899.....	3,091,425	40,193,821	8,516,663	116,950,145	11,608,088	157,143,966	14,500,946
Totals.....	13,006,999	$158,896,971	31,415,758	$466,118,100	44,422,757	$625,015,071	

Compiled from vessel reports made to the U. S. Engineer Office, Duluth, Minn., in compliance with the act of Congress, approved February 21, 1891.

CLINTON B. SEARS,
Major, Corps of Engineers, U. S. A.

FORCED DRAFT.

Of the various methods of forced draft, two have had the greatest vogue; that where the fire room is closed and the air forced into it, and that where the fire room is open but the ash pit is closed, either in the simple form or as part of the casing over the boiler front, the air in either case being forced into the ash pit and into a casing around the furnace door and thence over the fire. A modification of this latter form, with considerable elaboration for the purpose of heating the air forced in, is the system of Mr. Howden, which has probably been used more extensively than any other in merchant vessels, and is used almost exclusively to-day in the express steamers of all the great mail lines, says the Engineering Magazine.

The system in which the fire room is closed and the air forced in—then acting just as in the case of natural draft—is the one which has been used most in the naval service, for the reason that it requires the fewest fittings and generally speaking is the simplest. In all war vessels the boilers are below the protective deck in any event, so that it requires very little additional structural work in the way of bulkheads to provide for placing the fire room under pressure.

The system by induced draft or suction has been used to some extent, and quite successfully; but its use does not compare in extent with the other two already mentioned, and for the purpose of this article it need not be further considered.

DULUTH HARBOR PIERS,

Relative to the completion of the new ship canal piers at Duluth many of the best citizens at the head of the lake ports, viz. Duluth-Superior, are beginning to talk of taking some formal recognition of the improvement when that day shall have arrived. Senator F. B. Daugherty, of Duluth, says that the work is one of the grandest achievements in that line he has ever seen, and that the piers will be the noblest harbor entrance in the United States, if not in the world. It is proposed to invite many notable people to witness the driving of the last spike, which will be done by Maj. Clinton B. Sears, United States Engineer, in charge of river and harbor work on Lake Superior. There will be speeches and a banquet, and the completion of the great work will be appropriately observed in every way. The new piers will cost between $500,000 and $600,000 when they are finished, and the canal will be widened to 300 feet. Maj. Sears takes an especial pride in the canal pier work. The piers will be one of the enduring monuments to his reputation as an eminent military, as well as civil engineer.

THE wrought iron shaft which broke recently on the steamer Puritan of the New York, New Haven & Hartford R. R. Co.'s service, will be replaced by the Bethlehem Steel Co. with a hollow forged, steel shaft, to be turned out from their extensive works at South Bethlehem, Pa.

VESSELS UNDER CONSTRUCTION.

(WARSHIPS EXCLUDED).

The following table apportions the vessels now under construction in the United Kingdom to the countries for which they are being built:

COUNTRY FOR WHICH INTENDED.	STEAM.		SAIL.		TOTAL.	
	No.	Gross Tonnage.	No.	Gross Tonnage.	No.	Gross Tonnage.
United Kingdom.	370	960,049	30	7,028	400	967,077
British Colonies..	22	20,987	3	650	25	21,637
Argentine.....	2	260	...	.....	2	260
Austria-Hungary	13	37,189	...	.....	13	37,189
Belgium.....	2	5,800	...	.....	2	5,800
Brazil.....	10	3,895	...	.....	10	3,895
Chili	2	3,560	...	.....	2	3,560
China.....	2	3,600	...	.....	2	3,600
Egypt	5	500	1	270	6	770
France.....	7	8,520	...	.....	7	8,520
Germany	18	84,011	...	.....	18	84,011
Hawaii.....	...	.....	1	1,000	1	1,000
Holland	6	29,580	...	.....	6	29,580
Japan.....	3	6,883	...	.....	3	6,883
Norway.....	5	8,400	...	.....	5	8,400
Portugal	1	460	...	.....	1	460
Russia	4	3,870	...	.....	4	3,870
Spain	1	1,938	...	.....	1	1,938
Sweden.....	...	.....	...	.....	...	.....
United States....	2	3,350	1	1,400	3	4,750
Foreign (Country not known).....	3	1,400	...	.....	3	1,400
For Sale, or Nationality of Owners not stated	33	64,847	7	975	40	65,822
TOTAL	511	1,249,099	43	11,323	554	1,260,422

The total number of warships are 81, having a total displacement of 454,110 tons. This shows a combined tonnage of 1,714,532. Of this tonnage (excluding warships), 511 vessels of 1 205,280 tons are for classification in Lloyd's Register Book.

MARINE PATENTS.

Patents issued May 1, 1900. Reported specially for the MARINE RECORD. We furnish complete copies of patents at the rate of 10 cents each.

648,447. Bascule bridge. F. G. Vent, Chicago, Ill.

648,460. Vessel propelling mechanism. M. B. Hunter, Edwardsville, Kas., assignor of one-half to O. M. Schee, Kansas City, Mo.

648,467. Boat. J. C. Nichol, Montreal, Canada.

648,620. Portable adjustable vessel-loading device. H. C. Holmes, San Francisco, Cal., assignor to R. D. Chandler, same place.

648,697. Swimming hose. Paul Kurts, New York, N. Y.

CHAS. E. KREMER, ESQ., for Capt. James Davidson, has sued the Chicago drainage trustees for $6,483 for alleged unpaid repairs to the steamer Juliet.

SHIPPING AND MARINE JUDICIAL DECISIONS.

(COLLABORATED SPECIALLY FOR THE MARINE RECORD).

Collision—Vessel Breaking from Moorings—Burden of Proof.—A vessel which breaks from her moorings and drifts against another, to relieve herself from liability for the injury, has the burden of proving that the breaking away and drifting were excusable. The Waterloo and Glenalvon, 100 Fed. Rep. (U. S.) 332.

Collision— Security to Answer to Cross Libel—Suit by Master.—The fact that suit to recover damages for the sinking of a vessel by collision is instituted by the master, instead of the owners, does not withdraw the case from the application of the fifty-third admiralty rule, requiring the giving of security by the libelant to respond in damages as claimed in a cross libel; nor should the court be influenced, in requiring such security, by the fact that the libelant is individually unable to furnish it. Old Dominion S. S. Co. vs. Kufahl, 100 Fed. Rep. (U. S.) 331.

Admiralty—Proceeding for Limitation of Liability—Time for Filing Claims—In a proceeding by the owners of a vessel for the limitation of their liability for damages on account of a collision, and to contest their liability, where the vessel has been appraised, and a stipulation given by the petitioners for her release, the court is not precluded, either by the statute or by the rules in admiralty, from permitting the filing of claims after the time fixed by the monition therefor has expired, where the fund still remains in court undistributed, and a proper showing is made, upon such terms as may appear equitable. The Argus, 100 Fed. Rep. (U. S.) 143.

Shipping—Injury to Cargo—Right of Consignee to Sue in Rem.—The consignee of a cargo may maintain an action in admiralty against the vessel for an injury to his interest therein, and, when he is vested with the legal ownership by an assignment of the bill of lading, he may recover for any breach of the contract made by such bill of lading; but where there was no bill of lading, and he has no interest in the cargo, if he is, in any event, authorized to recover against the vessel on behalf of the consignor, it can only be such damages as result from a breach of the contract between shipper and carrier, and arising after the cargo has been received on board. The Habil, 100 Fed. Rep. (U. S.) 120.

Collision—Evidence.—A steam tug, with two barges—the tow being about half a mile long—was entering the roads at Fortress Monroe, before daylight, for the purpose of anchoring, when the barges struck and sunk a schooner at anchor. The wind was blowing 20 miles per hour, the tide was in flood, and a snowstorm had been raging. The master of the tug saw the schooner when about 400 feet abeam, but did not change his course. The schooner was in the usual anchoring place for vessels seeking shelter from storms. The tug had passed several places where it could have safely anchored and shortened its hawsers. Held, that the tug was in fault. The Minnie, 100 Fed. Rep. (U. S.) 128.

Collision—Drifting of Vessel from Anchorage—Inevitable Accident.—The schooner Robbins was forced by stress of weather to put into an anchorage, where she cast two anchors, one of which was attached to a chain, and the other to a new hawser of ample strength. In some unknown manner the hawser became cut, and the schooner, dragging the other anchor, drifted during the storm against another vessel which had subsequently anchored to the leeward, and injured her. Held, that in the absence of evidence of any negligence on the part of her crew, the injury must be held to have been due to inevitable accident, for which the schooner was not responsible. The Mary J. Robbins, 100 Fed. Rep. (U. S) 141.

Repairs under Contract with Equitable Owner—Massachusetts Statute.—Where a vessel is sold, and, after part payment of the purchase price, is delivered to the purchaser under an agreement by which he is authorized to make alterations and repairs at his own expense, the purchaser becomes the equitable owner, and may charge the vessel with liens, under Pub. St. Mass. c. 192, § 14, which gives a lien to one furnishing labor or materials for the repair of a vessel under a contract with the owner. It is not essential to the right to a lien under such statute that the repairs should have been under a mutual understanding between the contracting parties that credit was given to the vessel. The Iris, 100 Fed. Rep. (U. S.) 104.

Shipping—Breach of Charter Party—Right of Action for Damage.—Libelant hired the libeled vessel under a time charter, and engaged her in voyages to a foreign port for bananas. It filed the libel to recover damages for breach of the charter party, alleging that, by reason of the defective condition of her boilers, more time was consumed in the voyages than should have been, whereby it was required to pay for the time so lost, and the fruit became damaged, and large quanties were lost, while waiting shipment and on the voyages. The evidence showed that the fruit was not owned by libelant, but by a company at the port of loading, which shipped it to libelant, to be sold on commission, libelant retaining from the proceeds the freight, all advances, and its commissions, and that libelant had been reimbursed in such manner for all freight and advances on account of the shipments in question. Held that, conceding the breach of contract alleged to have been proven, libelant had sustained no damage therefrom which would sustain the action. The Habil, 100 Fed. Rep. (U. S.) 120.

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CLEVELAND, O., MAY 10, 1900.

LABOR troubles are still in the air at several lake points and action is active in its inactivity at two or three ports.

THE unique device of superimposed turrets on the new battleship Kearsarge, eight-inch guns being placed directly over twelve-inch monsters, has been the subject of considerable divergence of expert opinion. Repeated trials and experiments under varying conditions, in heavy weather, etc., will alone "tell the tale" in the face of such an array of technical, expert contrary opinion.

YACHTING will be the order of the day or rather season, at all lake ports this summer. Never were preparations for fancy and pleasure sailing carried on at so lively a gait as they are now. Yachtsmen are more than energetic in building, repairing and fitting out their little craft. Furthermore, it is now quite palpable that this will be the banner and record year for the lake passenger service, and we confidently look forward to see more persons carried by the various passenger lines and on excursion trips than during any previous season.

THE first total loss of the season must be recorded as that of the schooner R. Hallaran, from Two Harbors to Conneaut, foundered off Stannard Rock, Lake Superior, with a cargo of iron ore. The Hallaran was built at Toledo, in 1880, and was owned in Cleveland. The loss on ship, freight and cargo will be in the neighborhood of $25,000. From the season outlook it is probable that the hull itself could not have been purchased for this amount, and as it was her first cargo for the year her late owners will stand to lose a considerable sum of money, that is, taking the net earnings of a successful and prosperous season into account.

THE Secretary of the Treasury has sent to Congress the report of the Light-House Board, regarding an additional appropriation for the light-house tender for the ninth district on the lakes, with the recommendation that the appropriation be made. By the act of March 8, 1899, $85,000 was appropriated for the purpose, but the report of the Light-House Board states that the perils of the lakes during fall and early spring are so great that a lighthouse tender should be constructed with special reference to this fact. Accordingly, an additional $30,000 is asked for, every cent of which we think will be found necessary for the construction of an adequate and capable craft to act as a lighthouse tender for the ninth district. Comparative yawl boats fitted with a coffee mill as a propelling device can't be used on the lakes as formerly. The best craft in the light-house service has none too much ability for the work which a tender and supply boat has now to do in the ninth district.

TO MAINTAIN A NAVIGABLE WATERWAY.

At last due interest is being aroused regarding the navigable, or rather the present unnavigable condition of Chicago river.

Just what is now taking place could as easily have been foreseen several years ago, in fact there were not wanting those who pointed out the almost certain effect of a flow of 300,000 cubic feet of water a minute through the narrow and numerously obstructed channel known as the Chicago river.

There is not the shadow of a doubt but that the opening of the drainage canal has already caused great damage to marine interests. The river has been shoaled, a dangerous current created, and a serious tapping of the Lake Michigan supply has set in, thus affecting to that extent all ports along the lakes, and the end is not yet.

It would appear that the drainage commissioners had landed the sanitary district into an untold list of damage suits, as it is not to be thought for a moment that the losses, damages, detention and extra expenses loaded on to the shoulders of the owners of vessel property, may not be recovered from the sanitary district benefitted at the positive loss of transportation interests. It is quite true that the then Secretary of War did, on May 8, 1899, grant permission to the sanitary district of Chicago to open the channel and cause the water of the Chicago river to flow into the same, subject to certain conditions, including a condition that the sanitary district must assume all responsibility for damages to property and navigation interests by reason of the introduction of a current in the river. The commissioners having accepted the terms must agree to the conditions and reinburse those who have been put to an outlay on account of their action.

THE Chief of the U. S. Weather Bureau, Prof. Willis L. Moore, is entitled to the thanks of the lake marine community for the direct and excellent attention he has been giving, for some time past, to the weather conditions, etc., prevailing on the lakes. For several weeks prior to the opening of navigation, Prof. Moore caused to be issued, a weekly official report of the ice conditions existing at all of the principal ports, thus rendering marked service to varied and important interests. Navigation having been resumed, the first issue of a monthly meteorological chart of the lakes is now before us, compiled under the direction of the Chief of the Weather Bureau, by Alfred J. Henry, Professor of Meteorology, Washington, D. C. and Norman B. Conger, Inspector and Marine Agent, Detroit. The good work is not limited, however, to the publication of the foregoing reports and delineations, weather signals and display stations are being increased and greatly improved at a number of ports, and a mass of meteorological data is being gathered which, after a few years, will prove of the greatest value in determining certain physical economies known to exist, but unaccounted for at the present time. Those in actual service on the lakes will be but working for their own ultimate benefit by rendering all convenient aid to the Weather Bureau marine agent or other officials, and, as we have said, there is now a chief at the head of this service who is willing to, and is taking, the greatest interest in lake marine affairs, this is more than we have ever had before, therefore, we bespeak all assistance for him so as to further enhance the intelligence already partly developed.

IT IS astonishing how so many people can be blinded to their own best interests, here, we have had the Chicago drainage canal before us for the past decade, the present condition of the Chicago river was a foregone conclusion and yet not a word of protest had been heard from the vessel interests. The drainage canal comissioners seems to have downed, perhaps drowned, would be a better word, all opposition to their project, supreme will and power. It is simply impossible to safely handle large vessels in a sluiceway. On the other hand, given plenty of room and even a ten mile current would not be an entire bar to free and safe navigation.

NEW TONNAGE.

Within the next thirty days about 20,000 tons of carrying capacity will be added to the merchant marine of the lakes in the form of three large steel cargo boats.

The steel steamer Charles Van Hise will be launched at the West Superior shipyard in about a fortnight, for the Bessemer Steamship Co. According to official measurement her registered length is 458 feet; beam, 50 feet 2 inches; depth 25 feet. Tonnage, gross, 5,117.37; net, 4,444.21. The carrying capacity of the steamer is estimated at 8,000 net tons, equivalent to 266,600 bushels of wheat. The engine is a quadruple expansion 20½, 30, 43½ and 63 by 42 inches, and will develop a maximum of 2,500 horse-power. Steam is to be furnished by three Scotch-type boilers, each 13 feet long and 15 feet in diameter.

Two large steamers will also be launched from the Wyandotte yards of the Detroit Ship Building Co. The Harvard, a steamer 476 feet over all, built to the order of the Pittsburg Steamship Co., (Carnegie Co) is dated for the 19th, later to be followed by the Lafayette, Princeton, Cornell and very probably Columbia, and as consorts Bryn Mawr, Wellesley and Vassar.

Then comes along a steamer built for Eddy Bros., 442 feet in length, to be named the Simon J. Murphy, and at a still later date a sister ship building for the same owners.

It is noteworthy and much to the credit of the Detroit Ship Building Co., that the keel for the 8,000-ton steel cargo steamer Harvard was laid just five months ago, and allowing thirty days for completion and equipment, this vessel will likely be in service in 180 days from the time her keel was laid, and this, too, at a time and through a period when it was impossible to get material as fast as construction could be carried on.

CHICAGO AN UNSAFE PORT—RIVER RENDERED UNNAVIGABLE—TO APPEAL TO THE SECRETARY OF WAR.

Navigation of Chicago river has been made dangerous by the opening the Chicago drainage canal and the consequent lowering of the level of the water in the river. In addition to the trouble with low water, which barely allows the passage of the larger vessels plying the lakes, the current has been increased to five miles an hour, multiplying the danger to big vessels in the river.

The matter has been formally taken up by the Lake Carriers' Association and it will insist that something be done to change present conditions, which are regarded as intolerable.

A special meeting of the Lake Carriers' Association called at Buffalo on Wednesday was held in the committee room of the Merchants' Exchange. Frank J. Firth, of Philadelphia, former president of the Lake Carriers' Association, presided. The trouble in Chicago river was discussed, and it was the unanimous opinion of the members of the Association, representing all the big ports on the lakes, that the annoyance, danger and expense of moving ships in Chicago river since the opening of the drainage canal were more than could be endured.

It was decided to send a committee to Chicago to confer with the drainage commissioners of that city and insist that something be done for the protection of marine interests.

In addition to this action, it was decided that if the committee fails to accomplish its purpose in Chicago, a formal protest will be lodged with the Secretary of War.

The grant under which the opening of the Chicago drainage canal was permitted expressly provided that the level of water in Chicago river should not be lowered and that the current should at no time exceed 1¼ miles an hour. It is said that the violation of this provision is unquestioned.

F. J. Firth, of Philadelphia, James Corrigan and H. D. Goulder, Esq., of Cleveland, W. C. Farrington, C. H. Keep and J. G. Keefe will represent the Lake Carriers at the conference with the drainage commissioners of Chicago, and will go to that city at once.

ALL COAL DETERIORATES WHEN EXPOSED.

All coal deteriorates or decays to a more or less degree by disintegration or crumbling, and also by the gradual combustion of the volatile element. Atmospheric oxygen is absorbed and converts the hydro-carbons into water and carbonic acid. It has been proved in one case in Germany, according to Clarke's "Rules, Tables and Data," that bituminous coal, after having been exposed for nine months, lost half its value as fuel; coal exposed for three months to a temperature of of 284 degrees F. lost all its hydro-carbons. The coke manufactured from coal thus deteriorated is inferior to coke made from coal freshly mined. The decay of coal proceeds more rapidly in hotter climates; dryness is unfavorable to the change, while moisture accelerates it. When sulphur or sulphurate of iron is present in considerable quantity in coal which is changing under the action of the air, a second powerful heating cause is introduced, and both acting together may produce spontaneous combustion. The presence of sulphur or iron pyrites alone, if in considerable quantity, is sufficient to excite combustion.

THE INVENTIONS OF GUSTAVE ZEDE.

The first submarine boat built by Zede was named Gymnote, and was laid down at Toulon in 1886. To all intents and purposes she was nothing more than a large Whitehead torpedo, and her dimensions were as follows: Fifty-six feet in length, five and nine-tenths feet in diameter, and a displacement of about thirty tons. Horizontal rudders enabled her to dive and to rise to the surface. She was driven by an electric motor of fifty-five horse-power, the current of which was supplied by a storage battery sufficient in capacity to run the vessel for four or five hours. The speed was about seven knots when submerged and nearly nine knots on the surface.

Water-tight compartments placed fore and after secured the required buoyancy, and the air necessary for the respiration of a crew of four or five men when the boat was submerged was carried in reservoirs. Detachable ballast which could be released from the interior of the boat was carried along the keel.

The trials of this boat were so satisfactory that Zede determined, in 1890, to build one of a similar type, but of larger dimensions. This vessel, originally named the Sirene, is now the famous Gustav Zede. Her dimensions are as follows: Length 147 feet, diameter 10.75 feet, displacement 260 tons. It has been found, however, that these dimensions are too great, and in the proposed boats they have been much reduced. The hull is shaped like a cigar, with long and sharply pointed ends, and its model conforms to the earlier patterns of the Whitehead torpedo. On the surface a maximum speed of 14 knots was maintained, and when submerged a speed of 8½ knots is claimed. A torpedo discharge tube is located in the nose and lies in the fore and aft of the boat, and a supply of Whitehead torpedoes, containing a charge of 220 pounds of guncotton, is carried. Ten men constitute the crew.

For over a year experiments were carried on with alleged results which, if true, are most promising. One of the most successful was the attack made by the Zede upon the French battleship, Magenta, which was made both while she was at anchor and under way. A very reasonable suspicion exists as to the fairness of this trial, for it is stated that the evolutions of the Magenta were not such as would have been attempted during hostilities.

Later the Zede ran from Toulon to Marseilles, a distance of about forty miles, and behaved, if all reports be true, in a very good manner. After reaching Marseilles the accumulators were still sufficiently charged to enable the boat to make the return trip to Toulon, thereby proving that their capacity is equal to a continuous run of from seventy-five to eighty miles.

A new French vessel is to be an improved Zede, and while here radius of action will be greatly enlarged, her dimensions are such as more than satisfy the demands of submarine warfare. She is to be called the Narval.

The boats heretofore described are intended for war purposes, but the Arganaut, invented by Simon Lake, represents a type intended for the exploration of sea-shallows and river-beds. The boat is thirty-six feet long and is shaped generally like a cylinder, although the stern is very sharp and the bow very bluff. The hull is mounted on three wheels, one acting as a rudder on the surface and as a guide-wheel when running on the bottom. Two wheels are carried at the bow. The interior of the boat has a middle room, in which the machinery and other apparatus are placed. At the forward part of this space is an air-lock which gives entrance to the diver's room without causing the air pressure to be reduced. When the boat is resting on the bottom, the explorers can leave the working-room by means of a water-tight trap-door.—Youth's Companion.

IMPROVEMENT IN WIND-SIGNAL DISPLAY STATIONS.

Electric lighting for night signals will be introduced at all wind-signal display stations where it is available. The following stations have already been equipped with the electric lights: Ashland, Wis.; Washburn, Wis.; Manistique, Mich.; Gladstone, Mich,; Kenosha, Wis; and Charlevoix, Mich.

It is the intention during the present season to erect at the more important stations a steel tower for the display of storm signals. It is also purposed to erect these special steel towers at all wind-signal stations on the lakes as soon as practicable. The erection of these towers will be noted on the monthly lake chart from time to time.

LAKE FREIGHTS.

Contrary to the general expectations, single trip charters have not held up to the figures paid on season charters. This may be only a temporary condition until the iron ore traffic gets fairly into swing, as there can be no doubt but that too early a start was made after ore and before the stock piles was in a fairly workable state on account of still being frozen.

There is a cut of 20 cents all around from season contract rates, and the figures now are, Escanaba 80 cents to Ohio ports, 85 cents to Buffalo, Marquette 90 cents, $1.05 from the head of the lakes with a preference given to medium sized tonnage. The slump in ore rates probably occurred through the large boats not being able to load on account of the ore being frozen, this also partially accounts for the demand for medium sized tonnage, as a couple of thousand tons can be got at easier than six or eight.

The grain rate out of Chicago which opened at 3 cents still remains at 2 cents on corn to Buffalo, 4 cents to Lake Ontario. The Duluth rate has gradually dropped and after remaining steady at 3 cents on wheat and that figure still being worked for, line boats accepted 2¾ cents to Buffalo, and that apparently settles the slump for the next few days at least, or until the ore trade brisks up.

Coal cargoes are rather more plentiful, Buffalo to Chicago 75 cents, Ohio ports to Chicago 70 cents, Milwaukee 65 cents, 60 cents to Green Bay, 55 cents to Portage or Sheboygan, to the head of the lakes 50 cents with some of the largest boats taking only half cargoes.

Lumber rates held firm at $3 per M feet from the head of the lakes to Lake Erie, a slump has also taken place in this rate as the last charter was made at $2.75 to Tonawanda but vessels say they will not accept less than the $3 rate.

IMPORTANCE OF THE LAKES.

In a recent memorandum to the House committee on appropriations, Admiral Bradford, U. S. N., chief of the Equipment Bureau of the Navy Department said, "Since the survey of the Great Lakes was completed the growth of commerce upon them has been unparalleled. Our lake fleet alone is greater than the fleet of any foreign nation excepting Great Britain and Germany. In recent years the amount of tonnage annually constructed on the Great Lakes has been greater than that constructed on the Atlantic, Pacific and Gulf coasts combined. More than half of the best steam tonnage in the United States is owned upon the Great Lakes. The vessels in these waters have increased very much in size as well as in numbers, and their increased draft brings them into contact with obstructions which were not necessary to consider in a survey of a generation ago, when deep-draft vessels were not employed in the navigation of the lakes. It has become necessary, in some of the shoaler straits and channels, to use a drag in order to discover some of the isolated rocks and other obstructions of small superficial area. This work can only be done by nautical people who understand the needs of the safe navigation of ships."

THE NEW CANADIAN STEAMER KINGSTON.

This steamer, to be built at Toronto by the Bertram Engine Works Co. for the Richelieu & Ontario Navigation Co., will be similar in character to the steamer Toronto, built by the same firm, but somewhat longer and with greater accommodation. She will run on alternate days with the steamer Toronto on the route between Toronto and Prescott, and will be ready for June, 1901. Her length over all will be 290 feet, beam 36 feet, depth 14 feet, draft of water 8½ feet.

The hull will be of open-hearth steel with four water-tight bulkheads, the main deck, also, will be wholly of steel. The hull will have considerable dead rise on the bottom, the general shape being based on that of the steamer Toronto, which has proved such a complete success both as to speed, economy of fuel and seaworthiness. The increased length will enable the lines to be somewhat easier and finer than those of the Toronto.

The boilers will be four in number, of the Scotch type, eleven feet in diameter, and eleven feet six inches long. Each boiler will have two furnaces of the Adamson type, forty inches in diameter, fitted with the Howden system of hot draft.

The engine will be an inclined triple expansion, with three cranks and three cylinders respectively, 28, 44 and 74 inches in diameter with 6 feet stroke and a working pressure of 175 pounds steam per square inch, capable of making forty revolutions, with feathering paddle wheels 22 inches in diameter with curved steel buckets ten feet four inches long and three feet six inches wide.

The average speed will be seventeen miles per hour, with capacity for twenty miles when required.

The general outfit, including steam windlass and capstan forward and steam capstan aft, fire and life-saving apparatus, water tanks for trimming purposes, steam steering gear, steam heating and water works system, artificial ventilation and electric light plant of 1,000 lights, will all be of the latest and most improved design.

LAUNCHES OF THE WEEK.

The steel cargo steamer Isaac L. Elwood was successfully launched from the West Bay City shipyards of the American Ship Building Co., Saturday, May 5.

The Elwood was built to the order of the American Steamship Co., (American Steel & Wire Co.) and named in honor of one of the principal stockholders. She is the third of the fleet known as the 500-footers, and the fourth will be ready for launching, also from the West Bay City yards, in about a month, thus completing the contract for 2,000 feet of high classed steel vessel construction, delivered in four fully equipped sections.

The general hull dimensions of the Elwood are the same as her sister ships the John W. Gates and J. J. Hill, viz., 497 feet over all, 478 feet keel, 52 feet beam and 30 feet molded depth. Estimated carrying capacity about 8,000 tons on a draft of 18 feet, quadruple expansion engines, water tube boilers, automatic stokers, steam steerer and all modern equipment as furnished the rest of the fleet and enumerated in vol. 23, No. 4, MARINE RECORD.

The Elmwood was christened by Miss Lily, the 11 year old daughter of Mr. Frank Jeffrey, superintendent of the shipyard. Capt. Harvey Mills will superintend the equipment and no time will be lost in getting the vessel ready for service.

The steel steamer Tampico, built by the Craig Ship Building Co., Toledo, to the order of Mr. Arthur Hawgood and others, Cleveland, was successfully launched on Wednesday, May 2.

The Tampico is built for lake and coast service and is of the largest Welland canal dimensions, viz. 256 feet over all, 246 feet keel, 42 feet beam and 25 feet molded depth. Engines, triple expansion, diameter of cylinders 19, 30 and 52 by 40 inches stroke. Boilers, 2 Scotch type.

The steel cargo steamer M. P. Palmer, built by the American Ship Building Co., to the order of the American Steamship Co., was successfully launched on Saturday, May 5, from the Cleveland yards of her builders.

The Palmer has been specially built for trading between the lakes, the river and Gulf of St. Lawrence. Her general hull dimensions are 256 feet over all, 242 feet keel, 42 feet beam and 26½ feet molded depth. Engines, triple-expansion, diameter of cylinders 18½, 31½ and 51 by 36 inch stroke. Boilers, 2 Scotch type, 12.4 feet in diameter and 11 feet in length.

The Palmer was christened by Mrs. Palmer, wife of the general manager of the American Steel & Wire Co , Mr. M. P. Palmer, in whose honor the vessel was named.

The re-built passenger steamer Mary was re-launched at St. Joseph on Saturday last and will be placed on the route between Chicago and St. Joseph about July 1.

In addition to the foregoing, several smaller craft and miscellaneous tonnage took their first dip in the water since our last issue.

NOTICE TO MARINERS.

UNITED STATES OF AMERICA—NORTHERN LAKES AND RIVERS—MICHIGAN.

TREASURY DEPARTMENT,
OFFICE OF THE LIGHT-HOUSE BOARD,
WASHINGTON, D. C., May 9, 1900.

GRANDE POINTE AU SABLE LIGHT STATION.—Notice is hereby given that, owing to repairs in progress on the light tower at this station, on Grande Pointe au Sable, easterly side Lake Michigan, the color of the tower will be changed from buff to partly buff and red, in horizontal bands, the latter varying in height as the work progresses, owing to the red paint on the metal work being erected.

When the work is completed, about June 30, 1900, the lower third of the tower will be white, the middle third black, and the upper third, including the lantern, white.

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TO COMPILE TONNAGE STATISTICS.

A systematic attempt to gather statistics of lake commerce is being put in operation by the Chief of the Bureau of Statistics of the Treasury Department at Washington. The rapid growth of commerce on the lakes, the deepening of harbors and channels, and the accompanying increase in size and capacity of vessels have created a great demand for accurate statistics showing the actual growth of commerce between the various ports in at least the important articles which enter into this great and rapidly developing traffic. Efforts to compile these statistics from the clearances or manifests now filed by vessel masters have proven unsatisfactory, as the master in many cases is unable to state accurately his final destination when he makes out his clearance papers, while the manifests surrendered at the end of the voyage do not show additions to, or discharges of cargo en route, especially if made within the district where the manifest is surrendered; and even if these were satisfactory, statistical compilations from them would entail upon collectors a greater amount of labor than could be expected of them without additional force.

The Bureau of Statistics has therefore prepared a form of supplementary manifest which each vessel master is to file with his ordinary manifest at the end of each trip, showing the quantity of cargo received at the beginning of his trip, the amount received or discharged en route and the amount discharged at the port of final destination. Those supplementary manifests will be filled out by the captains, delivered to the collectors at the end of the voyage, and by the collectors mailed to the Bureau of Statistics, where the compilations will be made; and by this exceedingly simple method the experts of the bureau will be able to present a complete picture month by month of the traffic of each port and between all ports on the Great Lakes in the principal articles which enter into commerce. It is not expected by the bureau that these statements will at present include package or miscellaneous freight, except a simple statement as to total tonnage, but if it is able to present an accurate picture of the movement of the great articles entering into the commerce of the lakes, such as grain of the various classes, flour, iron ore, pig iron, copper, coal, stone, lumber, etc., a long step will have been taken toward the establishment of a system of measurement of the commerce of the lakes and of each city or port upon the lakes.

The plan devised by the Bureau of Statistics has been submitted to collectors, engineer officers, vessel owners, the officers of the Lake Carriers' Association and editors of marine publications, and in all cases approved by them both because of its simplicity and the ease with which vessel masters will be able to supply the information required of them, and the further fact that its application will not in any way delay vessels, as the statement is to be filed at the end of the voyage, and the blanks which are to be supplied to masters can be readily filled out during the closing hours of the trip and filed with the ordinary manifest at the custom house, which the captain or his representative is, under present regulations, required to visit at the end of each trip. The form of this statement adopted by the Bureau of Statistics corresponds precisely with that used at the "Soo," with which most vessel masters on the lakes are already familiar, and thus their inconvenience in its use reduced to a minimum, while the fact that the compilations are to be made by the Bureau of Statistics relieves the collectors of any inconvenience other than that of seeing that the forms are properly filled out and filed by each vessel master at the end of each trip.

The compilation of the statistics thus gathered will be made under the direction of the Chief of the Bureau of Statistics by Mr. Waldon Fawcett, formerly connected with the marine columns of Cleveland papers.

It appears that even loaded steamers of medium size must keep away from Chicago. Assistant City Engineer Wilcox has fixed upon 16 feet 8 inches as the extreme lowest loadline for Chicago harbor. All vessels having cargoes consigned to Chicago must conform to this rule, which will be enforced until the tunnels are lowered. The average depth of water at present over the Washington and La Salle street tunnels is 16 feet 8 inches to 16 feet 10 inches.

NOTICE TO MARINERS.

UNITED STATES OF AMERICA—NORTHERN LAKES AND RIVERS—MICHIGAN.

TREASURY DEPARTMENT,
OFFICE OF THE LIGHT-HOUSE BOARD,
WASHINGTON, D. C., May 3, 1900.

ONTONAGON PIERHEAD LIGHT STATION.—Notice is hereby given that, on April 16, 1900, a temporary fixed red lantern light was established in the temporary structure recently erected on the west pier, 55 feet from its outer end, at the entrance to Ontonagon harbor, southerly shore of Lake Superior.

The focal plane of the light is 21 feet above mean lake level.

The structure is a square house, painted brown, with a square lantern, and stands at the end of the elevated walk.

The light will be maintained until the permanent light can be established in the iron tower to be built.

ISLE AUX PECHES RANGE BEACON LIGHTS.

Notice is hereby given that on April 28, 1900, lights, as follows, were established to mark the axis of the lower reach of the Lake St. Clair Twenty-Foot Dredged Channel:

Front Light.—Two fixed white lens-lantern lights, 10 feet apart horizontally, in line across the axis of the channel, and 18 feet above lake level, on a cluster of piles on the prolongation of the axis of the dredged channel, in about 19 feet of water, about 2,000 feet southwesterly from its lower end. The northwesterly of the two lights will illuminate 180° of the horizon to the northward of N. E. by E. ⅞ E. and S. W. by W. ⅞ W., so that, in coming up the Detroit river on the Windmill Point range line, this light may be run for as soon as it becomes visible. The structure carries a white day mark. In passing vessels must keep to the westward of this light.

Bearings of prominent objects from the light are:

Outer end Grossepoint Club House Dock, N. by E. ¾ E.; Windmill Point Light-House, W. ⅝ S.

Rear Light.—Two fixed white lens-lantern lights, 10 feet apart horizontally, in line across the axis of the channel, and 38 feet above lake level, on a cluster of piles in about 8 feet of water, on the prolongation of the axis of the dredged channel, about 4,650 feet S. W. ¼ W. in rear of the front light.

The four lights of this range mark two range lines parallel with and 5 feet on either side of the axis of the dredged channel.

When at the upper end of the channel, about abreast of Grossepoint Light Vessel, with the lights open so that the rear light of one range is in range diagonally across the axis of the channel with the front light of the other range, the observer would be about 40 feet from the axis of the channel and could safely increase the apparent horizontal distance between the lights about eight times without approaching too close to the line of buoys marking the edge of the channel. About midway between the light vessel and the lower end of the channel the apparent horizontal distance between the lights may be safely increased to sixteen times, and still further increased as the lights are approached.

By order of the Light-House Board.

FRANCIS J. HIGGINSON,
Rear-Admiral, U. S. Navy, Chairman.

LIGHT-HOUSE ESTABLISHMENT,
OFFICE OF THE LIGHT-HOUSE INSPECTOR, 9TH DISTRICT,
CHICAGO, ILLINOIS, May 3, 1900.

Notice is hereby given that a shoal with but 15 feet of water over it is reported, S. S. W., about two and one-half miles from North Manitou light station. The Rush Shoal can buoy bears E. S. E. ½ E. about one mile from this shoal.

The shoal will be buoyed as early as practicable.

By order of the Light-House Board:

F. M. SYMONDS,
Commander U. S. Navy,
Inspector 9th Light-House District.

REPORTED BY THE LOOKOUT.

The Canadian steamer Persia passed through the Soulanges canal on Friday, being the first loaded ship to use this waterway.

Smith, Davis & Co., of Buffalo, underwriters, had $11,000 insurance on the schooner Hallaran which foundered, recently, in Lake Superior.

Saginaw, which not many years ago was the greatest lumber-shipping port on the lakes, last week received 3,283,000 feet from Cheboygan, and will receive 15,000,000 from Ashland.

Seamen's union membership at different lake ports is given as follows: Buffalo, 837; Cleveland, 639; Tonawanda, 250; Chicago, 210; Milwaukee, 143; Toledo, 125; Ashtabula, 75; Ashland, 60; Duluth, 45.

The plans of United States Engineer Lydecker for the rebuilding of the breakwater and shelter harbor at Harbor Beach contemplate an expenditure of $500,000 for the main pier alone. It is proposed to construct a concrete pier that will serve as a protection against sea from any direction.

On account of the strike on the coal docks at Sheboygan many cargoes of coal are being diverted to Manitowoc and consigned to the Reiss coal docks. The docks are being extended to the river front at a cost of $15,000, and they will handle 300,000 tons this year, according to present plans.

Mr. C. A. MacDonald of Chicago, well known in connection with the insurance business of the lakes, says there is no truth in the report that he is at the head of the syndicate that was said to have about completed arrangements for the purchase of the property of the Miller Bros. Drydock Co., Chicago.

Mr. J. W. Duntley, president of the Chicago Pneumatic Tool Co., who has been touring Europe in the interest of his company, says he has discovered that 98 per cent. of all the pneumatic tools in use in Europe are Whitelaw and Boyer tools. These tools are the product of the Chicago Pneumatic Tool Co.

The New York office of the Detroit Graphite Mfg. Co. has been removed to 141 Broadway, Washington Life Bldg., where more central and commodious quarters have been secured to handle the rapidly increasing sales of their well-known brand of Superior graphite paints, which are used for coating metal surfaces.

Work will begin in a few days on the new government breakwater at South Chicago. The contractors, Hausler & Lutz, have been busy for months building cribs to be sunk as soon as possible. The breakwater will be 4,400 feet long, and will make South Chicago one of the best ports on Lake Michigan, if not on the chain of lakes.

Within a few weeks two combined lake and sea steamers will arrive from Dundee, Scotland, for Messrs. R. O. and A. B. McKay, of Hamilton, Ont. These will be put in the ore trade and later in the season will be used for carrying pulp from the Sault Ste. Marie pulp mills to eastern mills at Atlantic ports. All of the Canadian boats are for winter service on the Atlantic.

The first of the steamers of the Welland canal size now building in England for Francis J. Clergue, of the Canadian "Soo," will arrive on the lakes within six weeks. She will be named the Gargantua. The four others will follow shortly. The Gargantua is 243 feet long, with a molded depth of 19 feet 5½ inches, a beam of 36 feet, and gross tonnage 1,578. The other vessels are of like dimensions, and all will draw loaded, 17 feet of water.

The letter from Sweden to the American Ship Windlass Co., of Providence, R. I., is an unusually fine testimonial to the excellence of the steam towing machine manufactured by that company, which we have frequently referred to in these columns. It is interesting to note that this machine is commanding substantial attention in Sweden. The steam towing machine certainly is one of the most ingenious and valuable inventions of the age in safety and labor-saving marine devices, and it is only a question of time when it will become a regular equipment of all towing steamers.

A TREASURY DECISION.

PRIVILEGES OF THE IMMEDIATE-TRANSPORTATION ACT OF 1880 EXTENDED TO GREEN BAY, WIS.

TREASURY DEPARTMENT, April 25, 1900.

To officers of the customs and others concerned:

The appended act of Congress, approved April 18, 1900, extending the privileges of the immediate-transportation act of 1880, to Green Bay, Wis., is published for the information and guidance of all concerned.

O. L. SPAULDING, Assistant Secretary.

An act, to extend the privileges of the seventh section of the act approved June tenth, eighteen hundred and eighty, to the port of Green Bay, Wis.

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled, That the privileges of the seventh section of the act approved June 10th, 1880, governing the immediate transportation of dutiable merchandise without appraisement, be, and they are hereby extended to the port of Green Bay, in the customs collection district of Milwaukee, Wis.

Apyroved April 18, 1900.

DRAFT AT HARBOR ENTRANCES.

Soundings taken recently under the direction of Capt. J. G. Warren, Corps of Engineers, U. S. A., show the actual depth of water at the harbors named to be as follows :

Waukegan—Channel between the piers 13 feet deep, with a least width of 90 feet, and 40 feet wide and 16 feet deep; from 300 to 400 feet outside of the harbor entrance, there is a bar with least depth of 14.5 feet on it.

Kenosha—Channel 14 feet feet deep, with a least width of 70 feet.

Racine—Channel 15 feet deep, with a least width of 50 feet.

Milwaukee—Channel 19½ feet deep, with a least width of 180 feet.

Port Washington— Channel and basins 11½ feet deep, with a least width in channel of 90 feet; 100 feet outside of the entrance there is a bar about 100 feet in diameter, least depth of water on it 11 feet.

Manitowoc—Channel 19 feet deep, with a least width of 100 feet.

Two Rivers—Channel between the piers 11½ feet deep, with least width of 160 feet. At the harbor entrance there is a bar 425 feet long, which extends nearly from pier to pier —minimum depth of water on the bar, 10 feet.

Harbor of refuge at entrace of Sturgeon Bay Canal—Channel 40 feet wide, 15½ feet deep, and 120 feet wide, and 15 feet deep. At the harbor entrance there is a greater depth of water in the northern half of the channel than in the southern half.

Sturgeon Bay Canal—Channel 13 feet deep, least width of 80 feet

Green Bay—Channel 15½ feet deep, least width of 180 feet.

Menominee Harbor—Eighteen and one-half feet, least width of 300 feet.

Menominee River—Fifteen and one-half feet deep, of navigable width.

JAMES J. HILL, president of the Great Northern Railway, has made the prediction that within the next two years the freight tariff between Buffalo and China will be $8 or $7 a ton. Within that time, the magnate declared, he would be carrying freight from Buffalo to Hong Kong for less money than is now charged from Buffalo to San Francisco, the change to be made possible by building the largest steamships in the world on the Pacific, the biggest vessels on the lakes, and cars of unequaled size.

LARGEST AND FASTEST STEAMER.

The North German Lloyd has placed an order with the Vulcan Ship Building Co., of Stettin, for a vessel, which when completed will be forty eight feet longer than the White Star Liner Oceanic and many knots a day faster than the Kaiser Wilhelm Der Grosse.

No name for the new boat has been decided upon. She will have twin screws and a horse power of at least 45,000, which is 5,000 more than that of the forthcoming Hamburg-American line steamer Deutschland, which sails next month on her maiden trip. In length she will be 752 feet, the Oceanic being 704 and the Deutschland 685.

It is estimated that her time from Queenstown to New York will be four days and twenty-one hours, and from Southampton five days and nine hours, as her average speed will be between 24 and 25 knots an hour.

The record from Queenstown at present is a little over five days and seven hours, the distance being 2,770 miles. The average daily record of the Kaiser Wilhelm Der Grosse, at present the fastest large vessel afloat, is a fraction above 22 knots, while the new Deutschland is expected to make 23 knots.

VISIBLE SUPPLY OF GRAIN.

As compiled for THE MARINE RECORD, by George F. Stone, Secretary Chicago Board of Trade.

CITIES WHERE STORED.	WHEAT. Bushels.	CORN. Bushels.	OATS. Bushels.	RYE. Bushels.	BARLEY Bushels.
Buffalo	799,000	1,408,000	1,157,000	111,000	26,000
Chicago	11,373,000	6,576,000	1,937,000	398,000	.....
Detroit	263,000	239,000	14,000	8,000	1,000
Duluth	13,827,000	1,282,000	378,000	161,000	59,000
Fort William, Ont.	3,372,000	.....	.....	.....	.....
Milwaukee	221,000	10,000	1,000	.....	.....
Port Arthur, Ont.	193,000	.....	.....	.....	.....
Toledo	281,000	826,000	302,000	1,000	.....
Toronto	28,000	.....	8,000	.....	25,000
On Canals	199,000	112,000	159,000	41,000	20,000
On Lakes	3,924,000	494,000	384,000	89,000	412,000
Grand Total	49,825,000	18,137,000	7,037,000	1,143,000	1,195,000
Corresponding Date, 1899	27,466,000	22,045,000	7,891,000	953,000	1,601,000
Increase	.....	.....	.....	.....	96,000
Decrease	2,647,000	3,781,000	950,000	108,000	.....

While the stock of grain at lake ports only is here given, the total shows the figures for the entire country except the Pacific Slope.

Collision—Vessel Breaking from Moorings—Liability of Owner.—Two large vessels were moored side by side to a wharf on the Schuylkill river, off Point Breeze; being made fast to eight posts which stood along the edge of the wharf. During a sudden wind one of the posts pulled out. A careful examination of the remaining posts was made, but disclosed no weakness. On the next day there was heavy rain and high wind, and another post pulled out. The vessels could not then be moved without peril to themselves and to others; lines were taken to the only other available post. The storm continued, and the river rose to an unprecedented height, causing a vertical strain on the posts; and on the following morning the remaining posts pulled out, and the vessels drifted, dragging their anchors, which had been dropped, and struck and injured two other vessels, moored on the opposite side of the river. Held, that the vessels doing the injury were not liable, having taken all the precautions practicable; that it did not appear that it would have been practicable to carry an anchor ashore and imbed it in the earth after the first posts gave way. The Waterloo and The Glenalvon, 100 Fed. Rep. (U. S.) 332.

NOTES.

THE steamers Badger State and Empire State, which ran between Cleveland and Ogdensburg last year, will ply besween Menominee and Buffalo this season, taking the place of the Green Bay line. Mr. M. A. Bradley, Cleveland, is named as the general manager.

THE torpedo boat Thornton, now being constructed by the William R. Trigg Company, in Richmond, Va., will be launched about the middle of May. Secretary Long has selected Miss Mary Thornton Davis, of Worcester, Mass, grand niece of Capt. Thornton, who was executive officer of the original Kearsarge when she fought the Alabama, to christen the vessel.

MAJOR CLINTON B. SEARS, Corps of Engineers, United States Engineer in charge of the river and harbor work of Lake Superior, has completed his organization for superintendence and inspection of dredging operations on the Duluth-Superior harbor for the season of 1900. F. L. Dever, assistant United States engineer, will be in charge of dredging operations on the Duluth-Superior harbor. H. H. Wadsworth, assistant engineer, will be chief inspector on the Superior side of the harbor. G. A. Taylor will be chief inspector on the Duluth side.

THE Chandler & Dunbar Co., of the "Soo," represented by attorney John H. Goff, of Detroit, filed its brief with the Committee of Rivers and Harbors at Washington, setting forth the claims to rights already held by the company at the St. Mary's river rapids, where it has already an established water-power plant. The Chandler & Dunbar Co. asks congress to protect the company in making any grants to the Michigan-Lake Superior Power Canal Co., and asks for amendments to the agreements recently entered into by the Lake Carriers' Association, the Chandler & Dunbar Co., and the new canal company.

CAPT. C. T. BRONSON, of the steamer Sheboygan of the Goodrich line, reports having seen a waterspout about eight miles from the eleven foot shoal lightship in Green Bay last Saturday. It was directly in the boat's course, and coming due south at a lively rate. Though all speed was put on and the course of the vessel shifted immediately the spout passed less than a fourth of a mile away. It appeared to be about sixty feet in height, and its force was apparently great enough to have made splinters of any craft that came in its path. The spout was preceded by a sudden shifting of the wind from due west to due north, and the weather suddenly became biting cold. The wind was brisk while in the west, but became a living gale when it veered to the north.

THERE was more ice last winter in Lake Erie than during the winter of 1898-99. The ice remained longer during last winter, but navigation opened somewhat earlier, except the Detroit and Cleveland Line which was later than usual, the first boat not leaving Detroit until April 9. There was very little ice encountered between Detroit and Cleveland. The first boat to leave Cleveland was the P. P. Pratt on April 14. She passed Detroit on the 15th. Ice formed about the 1st of January and reached its maxium thickness in February, and the cold weather of the latter part of March held the ice firm so that it did not break up as early as usual. The ice fields, after the middle of April, were confined in the lake to the east of Cleveland and extended along the south shore from Ashtabula to Buffalo. These fields, though considerably broken up, were still visible at the close of the month of April. The ice began to break up over the west end, from Toledo to Huron, during the last week of March. The port of Buffalo opened April 27th, 1899, and on April 21, 1900, but the first entries made this season were through large fields of ice. The latter will, doubtless, soon disintegrate under the influence of warm weather.

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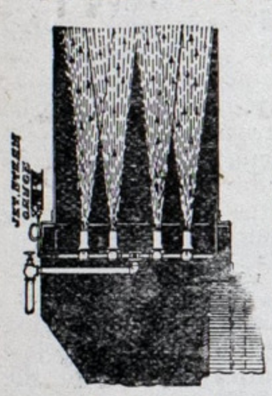

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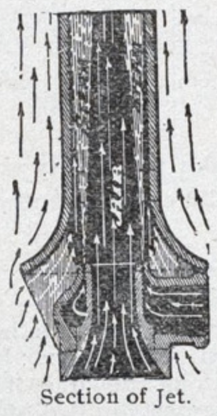

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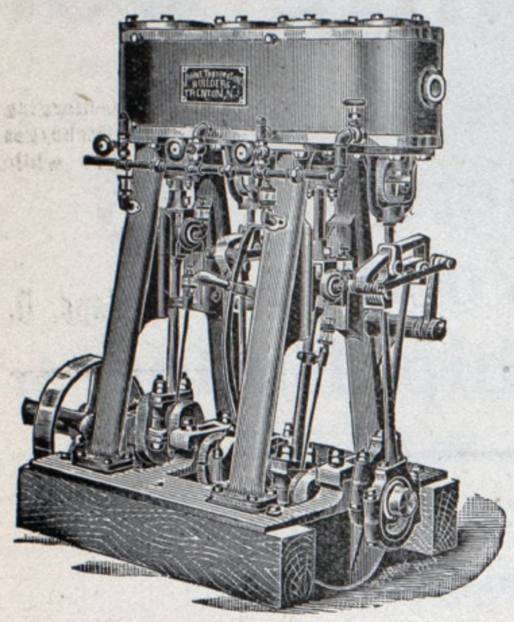

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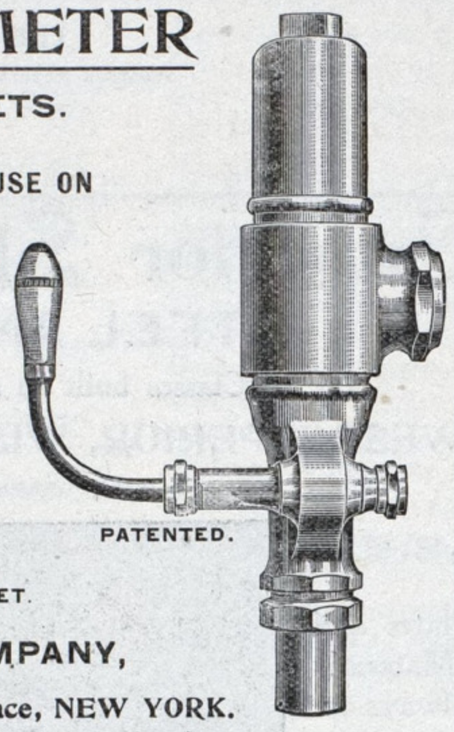

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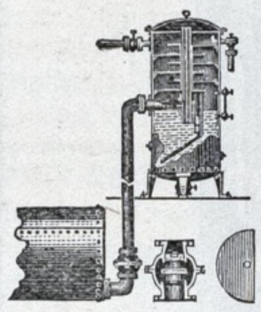

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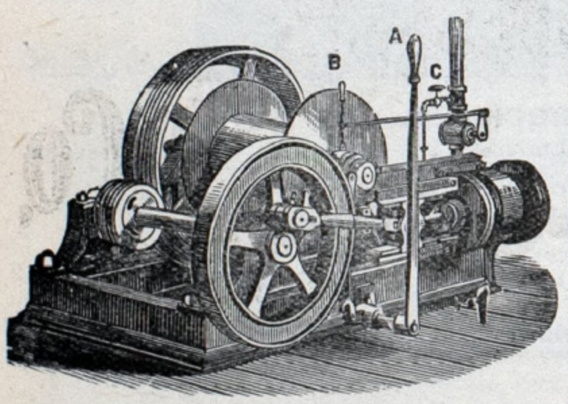

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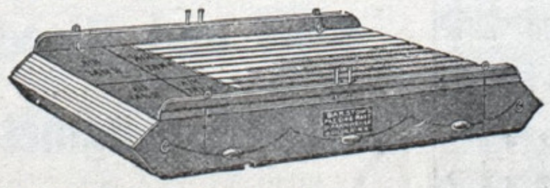

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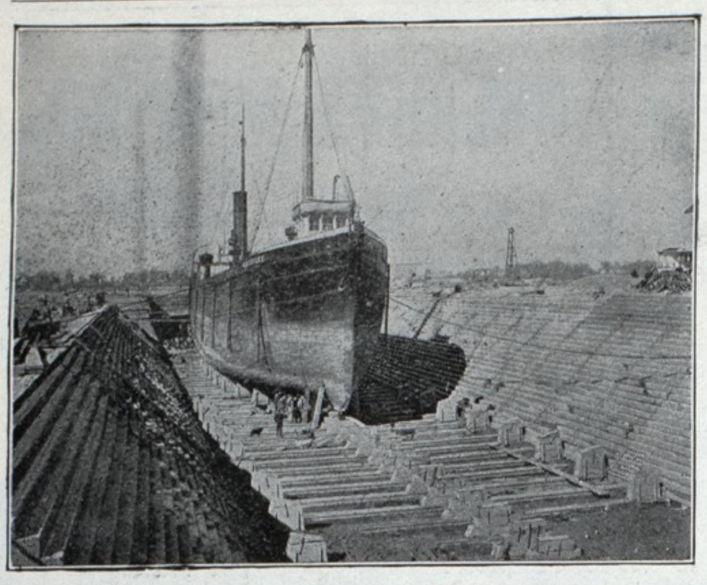

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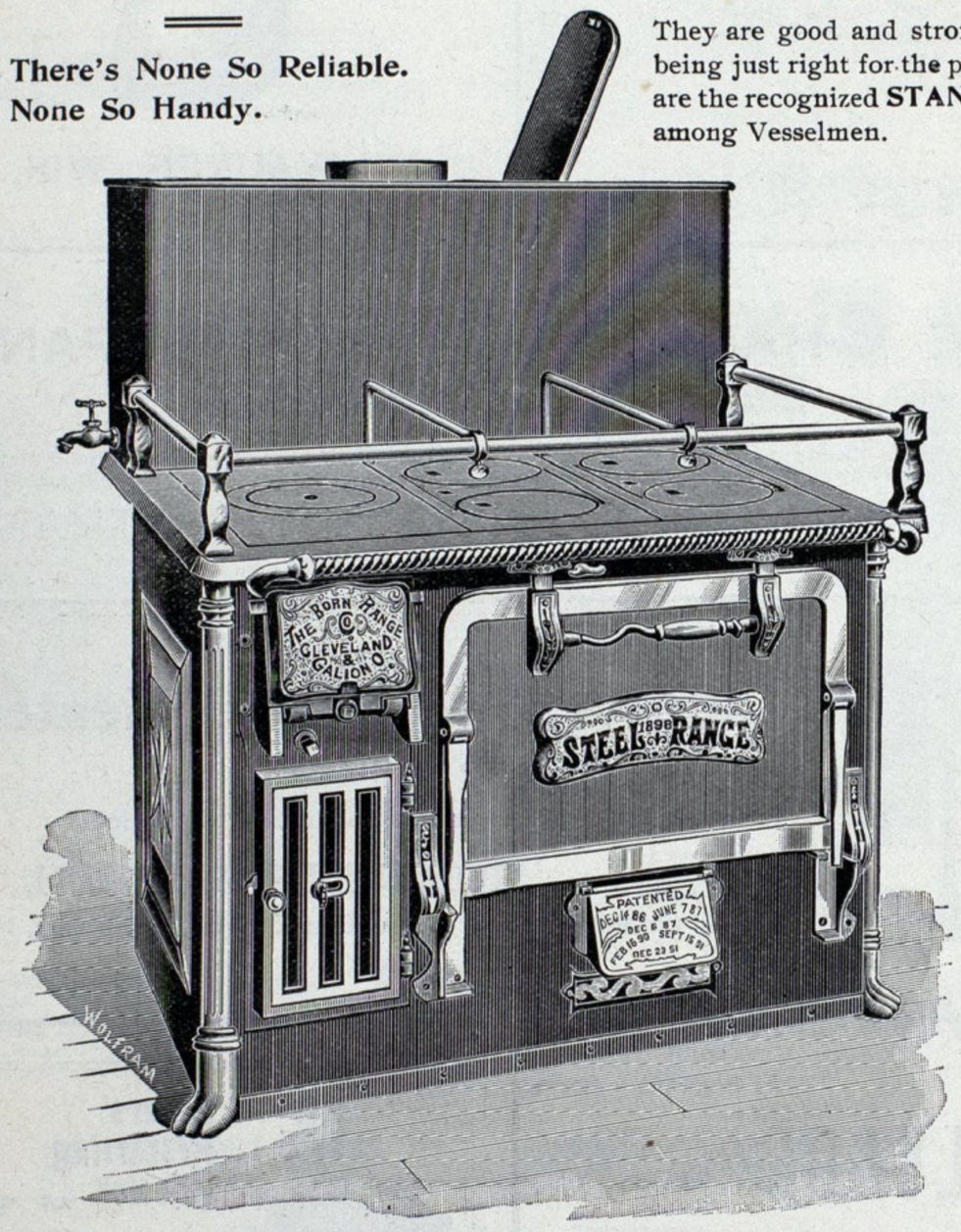

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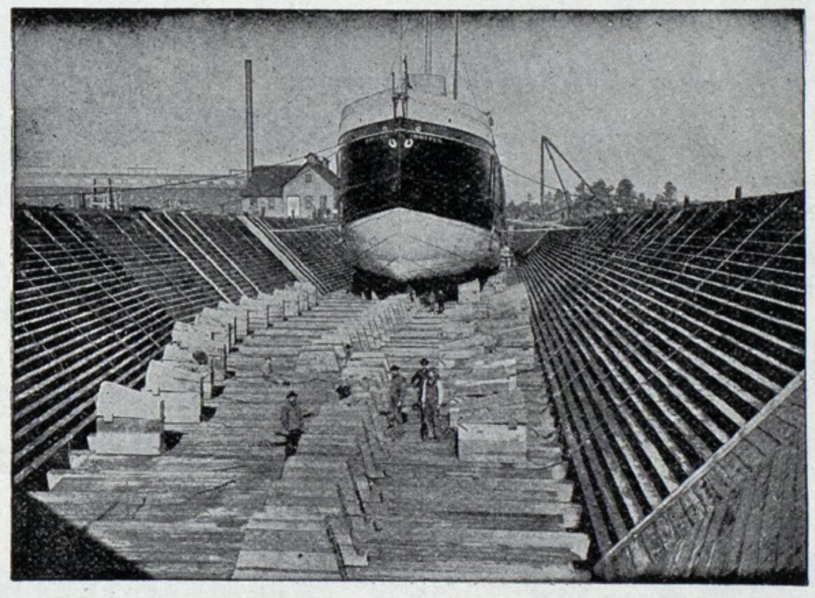

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